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**INSTITUTIONAL E-LEARNING POLICY IN CHINESE  
ACADEMIC HIGHER EDUCATION: AN INTEGRATIVE  
PERSPECTIVE ON FINANCIAL, HUMAN, AND TECHNICAL  
FACTORS**

**HU KAI**



**DOCTOR OF PHILOSOPHY  
UNIVERSITI UTARA MALAYSIA  
2025**



Awang Had Salleh  
Graduate School  
of Arts And Sciences

Universiti Utara Malaysia

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## ABSTRAK

Maklumat Pendidikan 2.0 sedang mengubah pendidikan tinggi China, namun dasar e-pembelajaran institusi dibentuk dan dilaksanakan masih tidak jelas. Kajian sedia ada jarang menjelaskan bagaimana arahan nasional berinteraksi dengan realiti institusi, lalu mewujudkan jurang antara niat dasar dan pelaksanaannya. Hanya sedikit kajian mengambil perspektif menyeluruh yang menilai faktor kewangan, sumber manusia, dan teknikal secara bersama. Kajian ini menangani jurang tersebut dengan menjawab: bagaimana dasar e-pembelajaran institusi menghalang atau menyokong e-pembelajaran dalam pengajaran dan pembelajaran menerusi perspektif menyeluruh di institusi pengajian tinggi akademik China. Kajian ini bertujuan untuk memahami bagaimana dasar e-pembelajaran dibentuk, ditafsir, dan dilaksanakan di institusi pengajian tinggi China. Kajian ini juga meneroka bagaimana dasar, faktor manusia, kewangan, dan teknikal saling berinteraksi dalam pelaksanaan e-pembelajaran, serta mendedahkan dinamika kompleks antara pihak berkepentingan, sumber kewangan, dan sokongan teknikal. Dengan menggunakan pendekatan kualitatif campuran iaitu analisis dokumen, temu bual separa berstruktur, dan kumpulan fokus, kajian ini melibatkan 124 peserta dari empat jenis universiti. Data dianalisis menggunakan rangka kerja analitik bersepadu yang menggabungkan Analisis Wacana Kritis (CDA), Teori Pihak Berkepentingan, dan Teori Aktiviti. Pendekatan ini membolehkan pemerhatian yang lebih sistematik terhadap naratif dasar, penglibatan pihak berkepentingan, dan dinamika pelaksanaan. Empat percanggahan dikenal pasti. Ianya melibatkan jangkaan yang tidak selaras antara pihak berkepentingan; jurang antara sumber kewangan dan keperluan institusi; ketidaksesuaian antara program latihan dan keperluan pensyarah; serta sokongan teknikal yang tidak mencukupi untuk pensyarah dan pelajar. Dasar e-pembelajaran institusi masih bersifat sementara dan berpecah, dengan penerimaan teknologi yang tidak sekata, inovasi yang terhad, dan penglibatan pensyarah yang rendah. Kajian ini menghasilkan satu rangka kerja berpusatkan dasar yang menggabungkan wacana, pihak berkepentingan dan sistem aktiviti untuk menjelaskan jurang antara niat dan pelaksanaan e-pembelajaran. Ia memperluas CDA, Teori Pihak Berkepentingan dan Teori Aktiviti, serta memberi panduan merangka dasar e-pembelajaran yang lebih koheren, peka konteks dan selaras dengan sumber serta keupayaan institusi.

**Kata Kunci:** Maklumat Pendidikan 2.0, Dasar pembelajaran dalam talian institusi, Pendidikan tinggi China, Berpusatkan dasar, Rangka Konseptual Rentas Dimensi

## ABSTRACT

Education Informatization 2.0 is rapidly transforming Chinese academic higher education, yet how institutional e-learning policies are formed and enacted remains unclear. Extant studies rarely explain how national directives interact with institutional realities, creating gaps between policy intentions and practice. Few studies take an integrative perspective that considers financial, human, and technical factors together. This study addresses these gaps by answering the question about how institutional e-learning policies hinder or support e-learning in teaching and learning from an integrative perspective at Chinese academic HEIs. The study aims to uncover how e-learning policies are constructed, interpreted, and enacted within Chinese HEIs. It seeks to explore the interaction between policy, human, financial, and technical factors in e-learning implementation, uncovering the complex dynamics among stakeholder, financial resources, and technical support systems. Employing a mixed qualitative approach, i.e document analysis, semi-structured interviews, and focus groups, the study interviewed 124 participants across four types of universities. Data were examined through an integrated analytical framework combining Critical Discourse Analysis (CDA), Stakeholder Theory, and Activity Theory. This enabled systematic observation of policy narratives, stakeholder engagement, and implementation dynamics. Four contradictions were discovered. They are misaligned expectations among stakeholders; gaps between financial resources and institutional needs; mismatches between training programs and faculty needs; and inadequate technical support for faculty and students. Institutional e-learning policies remain transitional and fragmented, marked by uneven technology adoption, limited innovation, and faculty disengagement. The study contributes a policy-centered, cross-dimensional conceptual framework that integrates discourse, stakeholders, and activity systems to explain why e-learning implementation diverges from policy intentions. Theoretically, it extends CDA, Stakeholder Theory, and Activity Theory by showing how these perspectives intersect in technology integration. Practically, it offers insights for designing more coherent, context-sensitive e-learning policies that better align financial resources, human capacities, and technological infrastructures.

**Keywords:** Education Informatization 2.0, Institutional e-learning policies, Chinese academic higher education, Policy-centered, Cross-dimensional Conceptual Framework

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In quiet hours of reflection, I bow in gratitude to unseen hands,  
And guiding spirits who have walked with me through distant lands.

No work is born of one alone, but shaped by many a silent plea,  
Like winds that stir the leaves of trees, though none their names may see.

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And for that gift, my thanks will ring, in endless reverie.

To Dr. Shan FeiYa, in this rare and solemn passage of life,  
and in moments that now belong to memory,

What once was has settled into stillness, not erased, but completed—  
like light that has finished its work and quietly withdraws.

Your presence, once near, now rests at a respectful distance,  
no longer calling, yet never diminished.

It remains a calm force, a clarity beneath uncertainty,  
a brief illumination in wonderlands and unsettled days.

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generous in spirit, and quietly resolute.

These qualities endure, even as paths diverge.

The story we shared has reached its proper close.

The spiritual conversations, the enlightenment, the resentment—  
these belong now not to time, but to understanding.

What was owed has been returned. What was lived has been honoured.

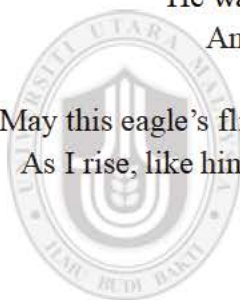
Most dearly, I offer love to family — to my mother,  
Hu Fengjiao, Whose strength, steadfast and true,  
Has been the shelter from all storms, where skies were bright and blue.  
To my father, Min Qiuhua, whose quiet care,  
unwavering as the earth, beneath my roots doth grow.  
To my son, Hu Yaoqi, whose presence reminds me why we strive —  
Pure, bond, full of promise, keeping dreams alive.  
Their unconditional love & support allow me to focus.  
As Shakespeare wrote in A Midsummer Night's Dream,  
“True love’s course is never smooth,”  
Yet in your love, I find the path, steady, gentle, and in truth.

### The Eagle

By Alfred, Lord Tennyson

He clasps the crag with crooked hands;  
Close to the sun in lonely lands,  
Ring'd with the azure world, he stands.  
The wrinkled sea beneath him crawls;  
He watches from his mountain walls,  
And like a thunderbolt he falls.

May this eagle’s flight, high above, be a symbol of my journey,  
As I rise, like him, from humble roots to places far and free.



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## List of Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
CDA	Critical Discourse Analysis
CERNET	Chinese Education & Research Network
CPC	Communist Party of China
CSFs	Critical Success Factors
DT	Discursive Types
GCU	General Committee of the University
HEIs	Higher Education Institutions
LMS	Learning Management Platforms
MOE	Ministry of Education in China
OER	Open Educational Resources
TG	Text Genres
VR	Virtual Reality



# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

This study, with dedicated efforts, intends to explore the discourse and discursive language of institutional e-learning policies within Chinese academic higher education institutions (HEIs) under national directives of Education Informatization 2.0. It, also, aims to unfold the picture of how these policies are conceptualized, the ideological assumptions they carry, and how they shape e-learning strategies, and practices centering on technology integration into teaching and learning. Deploying a qualitative research methodology, this dissertation, critically and cautiously, evaluates both the discursive language of institutional policy texts and the practical experiences of stakeholders—they are faculty, IT specialists, administrators, and students. By integrating Critical Discourse Analysis (CDA), Stakeholder Theory, and Activity Theory, the research, an exploratory study, provides a nuanced understanding of the explicit narratives and the silences within policy texts, bringing to enlighten the real-world contradictions and challenges encountered during technology integration. The study, in addition, is navigated by a conceptual framework developed from a critical review of prior studies and established e-learning models, employing an integrative perspective—study institutional e-learning policies through the interconnected dimensions of human, financial, and technical factors.

This chapter outlays the major themes of the research and display the structure of the thesis. The architecture of introduction exhibits its layout in the following sections: Section 1.2 embodies the context of the study, offering a overview of historical development of e-learning and its landscape of e-learning within in Chinese higher education. Section 1.3 articulates the problem statement, answering why study e-learning policies at Chinese academic HEIs, underscoring the gap in the literature, and highlighting the necessity of exploring the primary research question. Section 1.4 outlines the research objectives. Section 1.5 presents the research questions, which guide the inquiry into the interplay among financial, human, technical and policy perspective. Section 1.6 discusses the justification and significance of the study. Section 1.7 outlines the operational definition of key terms.

By following this structure, the study seeks to generate a deeper understanding of how institutional e-learning policies are articulated and enacted from an integrative perspective across diverse academic HEI contexts in China, and how stakeholder dynamics and institutional conditions influence their success or limitations in fulfilling the objectives of Education Informatization 2.0.

## **1.2 Background of the study**

### **1.2.1 Historical context of e-learning in Chinese higher education**

The evolution of e-learning in China, to begin with, can be delineated into five distinct epochs (See table 1.1). In the 1950s and 1960s, pioneering research-oriented

universities laid the groundwork for distance education. The late 1970s, then, witnessed a seminal moment with the establishment of the Central University of Broadcast and Television, catalyzing nationwide distance education. It is also vital to see the 1980s marked further proliferation through specialized universities and satellite TV education. Not surprisingly, the nascent phase of e-learning (1994-1998) saw the incorporation of technologies such as CD delivery and CERNET (Chinese Education & Research Network, an internet-oriented delivery model). It is obvious to see the subsequent expansion phase (1998-2009) was underpinned by numerous national policies, fostering widespread adoption. More importantly, the focus transitioned to stringent regulation and enhancement of e-learning quality and governance from 2010-2018. Post-2018, the emphasis, remarkably, has been on transformation and qualitative development, with notable advancements in smart campuses, MOOCs, and comprehensive digital education platforms.

Table 1.1 Historical development of e-learning in Chinese Higher Education

Period	Major focus	Methods	Major Players	Major Achievements
1950s-early 1990s	Distance education	Broadcasting and television satellite TV	China Renming University North-east Normal University The central university of broadcast and television	Laid a foundation for the introduction of e-learning
Phase one 1994-1998	The initial introduction of e-learning	CD delivery, Satellite TV Broadcasting, and Chinese Education & Research Network (CERNET, an internet-oriented delivery model)	Tsinghua University, Zhejiang University, Hunan University, and Beijing Post & Communications University	Shifted the educational landscape from traditional classroom settings to diverse educational platforms
Phase two 1998-2009	The subsequent expansion of e-learning implementation	CD delivery/Satellite TV Internet technology/CERNET	The MOE expanded the list of pilot universities from 4 to 31	81.6% of educational institutions' single-campus units have internet access, while 74.6% of universities are connected to CERNET.
Phase three 2010-2018	E-learning regulations	Internet + Education Massive Open Online Courses (MOOCs): Smart-Higher-Education-Platform e-learning platforms Mobile technology, LMS, etc	All HEIs in China	The MOE liberalized regulations, allowing all educational institutions to embrace online courses and e-learning initiatives, thus paving the way for a more inclusive digital educational environment.
Phase four 2018-present	Transformation and quality development	E-learning platforms Virtual Reality, Cloud computing, Artificial intelligence, Mobile technology, LMS, etc	All HEIs in China	The platform has amassed 29.2 billion visits and 500 million course enrollments. Emerging technologies introduced in large-scale online education initiatives.

Source: Author's own work

### 1.2.2 The current landscape of e-learning in Chinese universities

In Chinese higher education context, there are three categories of higher education institutions classified by the Ministry of Education (MOE, 2017). They are Double-First-Class universities, Academic HEIs, and Vocational HEIs (See table 1.2).

Table 1.2 Stratification of Higher Education Institutions in China

Categories	Definition	Classification	Total
<b>Double First-Class universities</b> (Research Universities on the list of Double First-Class universities)	The Double First-Class Initiatives in China have a primary goal, which augments the nation's university system by cultivating a select cohort of esteemed universities and globally impactful academic disciplines. Within this framework, 42 research universities have been identified as harboring the capacity to achieve international eminence. Among them, 36 universities have been classified as type A, signifying their substantial progress towards attaining world-class status; 6 universities fall under type B, denoting their potential to ascend to such levels of excellence. Furthermore, a comprehensive assessment has identified 465 disciplines spanning 140 research universities, including the 42 universities, as possessing the potential to meet the rigorous standards required for global recognition (MOE, 2022).	First-class Universities: 42 Universities with First-class disciplines: 98	140
<b>Academic HEIs</b> (Research Universities not on the list of Double First-Class Initiative & application-oriented universities)	Research Universities not on the list of Double First-Class Initiative: Research universities have a primary focus on cultivating innovative intellectuals engaged in scholarly exploration. These institutions prioritize theoretical research and groundbreaking advancements, offering Bachelor's, Master's, and Ph.D. degrees with significant emphasis on postgraduate studies (MOE, 2017). Application-oriented universities: Application-oriented universities in China primarily focus on undergraduate education, aiming to produce talent that meets the demands of economic and societal progress. These universities are engaged in research related to social development and the implementation of scientific and technological innovations (MOE, 2017).	Research Universities not on the list of Double First-Class Initiative: 454 Application-oriented universities: 676	1130
<b>Vocational HEIs</b>	Vocational HEIs: They are primarily focused on training skilled professionals at the vocational level who actively contribute to production management and service provision. These universities are also enthusiastic participants in technological service enhancements and skill-based innovations (MOE, 2017).	Vocational HEIs under governments: 1137 Non-government Vocational HEIs: 399	1486

Source: Adapted from MOE of China (2017; 2021; 2022)

Overall, integrating e-learning displays an imbalance in performance across Double-First-Class universities, academic HEIs, and vocational HEIs, underscoring the need for increased investment in personnel, physical and financial resources. Double-First-Class universities outperform academic and vocational HEIs in terms of their investment in e-learning technologies, resource allocation, and IT infrastructure. When it comes to institutional development, planning, and execution, Double-First-Class universities generally demonstrate superior performance compared to academic and vocational HEIs. In terms of cost-effectiveness of implementing

e-learning, whether it be the completeness of infrastructure, the coverage of information systems, the depth of data governance, or the level of support for teaching and scientific research on e-learning, Double-First-Class universities take the lead over other types of universities (See table 1.3 & 1.4).

Table 1.3 Performance of adopting e-learning across Chinese universities

Categories	Faculty's development	Funding Per Capital	Student Engagement	Performance of Implementing e-learning
<b>Double First-Class universities</b>	Double First-Class universities follow closely with 87.1%, placing a great emphasis on enhancing teachers' digital competency and pedagogical skills	981.8 Chinese Yuan-CNY(2021) 1060.9 CNY(2023)	Bolstering institutional support Sufficient investment in faculty development Well-developed approach for embracing digital pedagogy	Occupy a prominent position and take a lead over Academic & Vocational HEIs
<b>Vocational HEIs</b>	Vocational HEIs prioritize training sessions the most, 89%, placing a greater emphasis on enhancing teachers' digital competency and pedagogical skills	973.6 CNY(2021) 856.6 CNY(2023)	Previewing course content 38%* Online discussions 33.37%* Self-directed learning 37.51%*	Despite facing challenges, have attracted more attention and funding from Chinese government.
<b>Academic HEIs</b>	Academic HEIs have the lowest percentage, at 80.4%, in terms of conducting training classes for teachers' professional development in digital literacy and pedagogical skills. Furthermore, the metrics employed for assessing faculty's digital literacy and pedagogical skills remain underwhelming, at 44.8%. A mere 39.0% of these institutions have established benchmarks for such evaluations.	662.6 CNY(2021) 592.7 CNY(2023)	Diminishing institutional support Inadequate faculty development A lukewarm approach to embracing advanced digital pedagogy	The noticeable lack of specialized studies on e-learning within academic HEIs, alongside the disparities between academic and vocational institutions, underscores the pressing need for academic HEIs to update and adapt to evolving educational landscapes.

(Source: The Information Technology Center of MOE, 2021; 2023) & \*(Tsinghua University, Tencent, & Department of Vocational and Adult Education of MOE, 2022)

Vocational HEIs in China prioritize cultivating skilled professionals to advance technological services and foster skill-based innovations (MOE, 2017). Despite their dedication, they grapple with challenges such as low student engagement in e-learning, with a mere 38% previewing course content, 33.37% engaging in online discussions, and 37.51% utilizing e-learning platforms for self-directed study (Report on the Development of Information Technology in Vocational Education in China, 2022). Furthermore, while 61% of these institutions have integrated a suite of 18 systems, including essential e-learning infrastructures like academic management and Big Data

centers, 1.3% of vocational skills-centric universities lack these systems entirely. Leadership training for e-learning implementation is inadequate, with satisfaction rates below 50% and digital literacy training at 40.97% (Tsinghua University, Tencent, & Department of Vocational and Adult Education of MOE, 2022). Despite higher per capita IT funding compared to Double First-Class and academic HEIs, vocational HEIs contend with insufficient digital resources and copyright issues, yet they excel in blended learning implementation (The Information Technology Center of MOE, 2021; 2023).

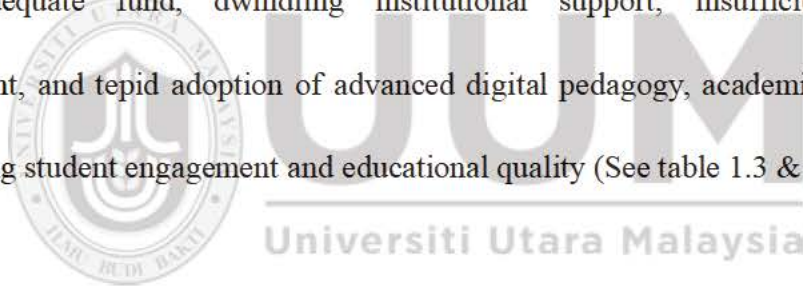
Table 1.4 Resource allocation for adopting e-learning across Chinese universities

Categories	Government Support	Self-funding	Funding-raising	Internet Infrastructure	Technical Assistance	Total Funding
<b>Double First-Class universities</b>	Financially Sponsored by central, provincial and local government: 13.843 Million CNY(2021) 14.13 Million CNY(2023)	11.949 Million CNY(2021) 13.61 Million CNY(2023)	7.333 Million CNY(2021) 8.298 Million CNY(2023)	Wi-Fi access points: 10004(2021)-12741(2023) Data center: 692m <sup>2</sup> (2021)-709 m <sup>2</sup> (2023) Physical Servers: 307(2021)-333(2023) Virtual Servers: 658(2021)-632(2023)	IT technicians: 40(2021)-38.3(2023)	33.345 Million Chinese Yuan (CNY)(2021) 37.27 Million CNY(2023)
<b>Vocational HEIs</b>	Sponsored either by central, provincial or local government: 5.816 Million CNY(2021) 5.884 Million CNY(2023)	4.1175 Million CNY(2021) 3.8625 Million CNY(2023)	1.004 Million CNY(2021) 1.0525 Million CNY(2023)	Wi-Fi access points: 1845(2021)-2598(2023) Data center: 165m <sup>2</sup> (2021)-184m <sup>2</sup> (2023) Physical Servers: 39(2021)-26(2023) Virtual Servers: 104(2021)-115(2023)	IT technicians: 10(2021)-9.3(2023)	10.944 Million CNY(2021) 10.897 Million CNY(2023)
<b>Academic HEIs</b>	Sponsored either by provincial or local government: 3.985 Million CNY(2021) 3.503 Million CNY(2023)	4.454 Million CNY(2021) 6.209 Million CNY(2023)	1.682 Million CNY(2021) 2.063 Million CNY(2023)	Wi-Fi access points: 3372(2021)-4019 (2023) Data center: 268m <sup>2</sup> (2023)-277 m <sup>2</sup> (2023) Physical Servers: 71(2021)-68(2023) Virtual Servers: 177(2021)-177(2023)	IT technicians: 15(2021)-14.9(2023)	10.122 Million CNY(2021) 10.286 Million CNY(2023)

(Source: The Information Technology Center of MOE, 2021; 2023)

Academic HEIs, vying with Double First-Class universities for the constrained MOE funds, are profoundly influenced by educational policy and regulations (Zhang & Wang, 2023). In 2023, a smaller proportion of academic HEIs received incentives for adopting technology-enhanced teaching compared to 2021, with fewer than half

utilizing mechanisms such as special rewards, funding support, and credit recognition, indicating diminished motivation due to inadequate incentives (The Information Technology Center of MOE, 2021; 2023). A mere 1.5% of courses employed virtual simulation platforms, 8.7% utilized smart classrooms, and only 9.6% were fully online, revealing a disparity between technological advancements and educational requisites (The Information Technology Center of MOE, 2023). Despite 80.4% of academic HEIs initiating faculty training, only 44.9% have sufficient metrics for digital literacy, and 38% have established benchmarks, showcasing a deficiency compared to vocational HEIs (The Information Technology Center of MOE, 2023). With inadequate fund, dwindling institutional support, insufficient faculty development, and tepid adoption of advanced digital pedagogy, academic HEIs risk undermining student engagement and educational quality (See table 1.3 & 1.4).



In summary, Chinese-Government-funded nationwide studies in 2021 and 2023 have scrutinized e-learning implementations across tertiary education sector in China. However, there remains a conspicuous dearth of comprehensive research dedicated exclusively to e-learning practices within academic HEIs. In contrast, Double First-Class universities have benefited from substantial support and resources, as highlighted by The Information Technology Center of MOE (2021; 2023). Despite encountering challenges, vocational HEIs have garnered more attention and funding from the Chinese government. The marked absence of specialized studies on e-learning within academic HEIs, coupled with the disparities between academic and

vocational institutions, underscores the urgent need for future research focused on this underrepresented group. Addressing this research gap is critical, as academic HEIs face inadequate fund, diminishing institutional support, insufficient faculty development, and tepid adoption of advanced digital pedagogy, all of which risk undermining student engagement and educational quality.

### **1.3 Problem Statement**

As elucidated in the background of this study, academic HEIs in China encounter greater challenges in implementing e-learning compared to other categories of universities. Compounding these difficulties is a pervasive lack of comprehension regarding institutional e-learning policy (Huang & Dai, 2021; Liu-Schuppener, 2023; Szeto, 2013), which hinders the recognition of its interplay with financial, human, and technical factors on e-learning initiative (Hu & Raman, 2024). This oversight leads to the undervaluation of these factors' roles in shaping and refining institutional e-learning policies at Chinese academic HEIs. These policies received criticisms due to lack of flexibility and autonomy, particularly to its over-dependence on its provincial government's supervision and funding (Yan, 2020), and its over-reliance on central government's overall plan (Liu-Schuppener, 2023). This lack of flexibility and autonomy could cause faculty and students do not perceive institutional e-learning policies as effective tool for mediating, thus discouraging them from participating in e-learning practices. Although national initiatives have emerged to give academic HEIs more freedom and allow them to cooperate with Double-First-Class universities

and for-profit organizations while implementing e-learning, academic HEIs presently far fall behind Double-First-Class universities.

Although academic HEIs in China make some efforts, they are marginalized owing to limited access to emerging e-learning technologies, resistance from faculty to embrace pedagogical shifts, lack of digital proficiency among faculty and students, and inadequate high-end IT infrastructures (The Information Technology Center of MOE, 2021; 2023). Academic HEIs have difficulty engaging in e-learning implementation due to possible impediments in their ability to plan, as well as a lack of professional knowledge about the complexity of e-learning technologies, pedagogical adjustment for emerging e-learning technologies, and evolving e-learning landscapes. A shortage of funding can further diminish the participation of academic HEIs in adopting e-learning. Insufficient training for faculty professional development and a lukewarm approach to embracing advanced digital pedagogy at academic HEIs also brings challenges to encouraging students' participation in e-learning practice. Diminishing institutional support—reduced emphasis on technology-enhanced teaching and the lack of institutional incentives—is another one. If Chinese academic HEIs continue to operate under such conditions, they risk further marginalization, widening gaps with Double First-Class universities, losing institutional credibility, and limiting students' readiness for digitally mediated learning and participation in the knowledge economy.

Academic HEIs represent 41% of Chinese universities and enroll nearly 40% of all

post-secondary students (MOE, 2022). In 2022, around 19 million undergraduates at these institutions experienced e-learning, marking a sixfold increase since 1997. These figures underscore the pivotal role of academic HEIs in China's digital transformation.

In China, national educational policy and various pieces of legislation mandate the inclusion of students in e-learning-oriented teaching and learning and underline the importance of integrating e-learning into higher education sector. The Tenth Five-Year Plan for National Education stipulates the necessity of integrating modern teaching and learning methods, particularly in higher education (MOE, 2002). Furthermore, in 2015, amendments to the Education Law, including Article 66, underscored the state's commitment to promoting the use of information technology (IT) in education. This entails accelerating the development of digital infrastructure and harnessing IT to enhance access to and dissemination of high-quality teaching resources, thereby improving both teaching and administrative functions. These developments highlight the imperative of incorporating e-learning into the higher education sector, with a clear focus on engaging students in digital teaching and learning environments (The National People's Congress of the People's Republic of China, 2015). The Act of Expanding Investment in Higher Education of 2022 (AEIHE) is another significant legislative act that explicitly outlines stipulations for the incorporation of e-learning into higher education, in particular for academic HEIs who have insufficient funding for implementing e-learning. In accordance with the Expanding Investment in Higher

Education Act, academic HEIs can be eligible for low-interest financial loans. Although the Act, a temporary incentive policy with a two-year duration, stipulates the provision of financial loans, lack of funding for maintaining and upgrading e-learning systems continue to be the primary obstacle for academic HEIs (The Information Technology Center of MOE, 2023).

The enhancement of IT, technological infrastructure, and the pedagogical use of IT in academic HEIs must align with the core tenets of Education Informatization 2.0, as discussed in the Chapter of literature review. At the macro level, e-learning policies and related legislation serve as key frameworks guiding Chinese HEIs toward their educational goals—developing digital literacy among faculty and students, advancing digital pedagogy, and building integrated e-learning systems that support effective technology use, real-time feedback, and quality assurance in digital teaching. Although the Ministry of Education provides clear technological and pedagogical standards under Education Informatization 2.0, to what extent do institutional policies align with these national objectives remains insufficiently studied. Many academic HEIs still face challenges in interpreting and implementing these requirements due to limited autonomy and uneven institutional capacity (Liu & Guo, 2020; Yan, 2020).

Although academic HEIs comprises a sizable subset of the university population in China, and legislation and national plans mandate their inclusion in the age of Education Informatization II (2018-Present), there is little empirical research about a

comprehensive understanding of institutional e-learning policy in HEIs, considering financial, human, and technical perspectives (Hu & Raman, 2024). Researching the role of institutional e-learning policy shaping e-learning practices in the age of Education Informatization II (2018-to-present) from an integrative perspective may yield valuable insights to supplement the literature about how institutional e-learning policies intertwine with technological advancements, resource allocation, pedagogical needs, and faculty's and students' attitudes in higher learning and further contribute to addressing these questions.

Overall, academic HEIs comprise an understudied group within the extant studies at the time of writing. Policy-centered on financial, human, and technical perspectives constitutes a multidimensional lens of this population's e-learning adoption, which have not been investigated in sufficient detail, including their subjective experience as they attempt to navigate e-learning initiatives in teaching and learning (The Information Technology Center of MOE, 2021; 2023). This subjective domain may encompass several areas, including institutional commitment from policy perspective on integrating e-learning technologies, faculty's perception and students' perception of institutional support. As discussed in the literature review, financial, human, and technical factors may influence students' engagement and learning outcomes. Moreover, faculty's and students' perception regarding the degree to which they see how institutional e-learning policies facilitate or hinder institutional support from an integrative perspective may impact their willingness to adopt e-learning. There is a

pressing need for further research to understand the challenges and factors affecting the implementation of e-learning in academic HEIs, particularly from an integrative perspective that considers policy, financial, human, and technical aspects.

This study aims to explore the interaction between policy, human, financial, and technical factors in e-learning implementation, uncovering the complex dynamics between stakeholders (faculty, students, administrators, IT staff), financial resources, and technical support systems. Specifically, this research initially scrutinizes the prevailing institutional e-learning policies within Chinese academic HEIs. It subsequently explores the interrelation between macro-level e-learning policies and those at the institutional level. Thereafter, the study investigates the ramifications of institutional e-learning policies on several dimensions, including financial investment required for supporting faculty to embrace e-learning technologies in teaching and learning, the availability of technical support for faculty and students, the enhancement of faculty proficiency in IT literacy and pedagogical skills. This study aims to address three gaps in the literature: (1) the lack of understanding of institutional e-learning policy in Chinese academic HEIs; (2) the lack of understanding on the interplay between macro-level and institutional e-learning policy in China academic HEIs; (3) the lack of studies examining institutional e-learning policy from an integrative perspective. The main research question of this paper is: how institutional e-learning policies hinder or support e-learning in teaching and learning from an integrative perspective at Chinese academic HEIs ?

#### 1.4 Research objectives

This research project aims to provide insights for understanding how institutional e-learning policies in academic HEIs in China influence the integration of e-learning into teaching and learning practices, with a focus on the interplay between macro-level and institutional policies, and on addressing financial, human, and technical factors. This study also aims to investigate how these policies facilitate or hinder institutional support from faculty and student perceptions, thereby addressing gaps in policy comprehension and implementation (see Appendix W). Followings are specific research objectives:

1. To critically examine institutional e-learning policies (2018–2024) in Chinese academic HEIs, and to conduct a discourse analysis to reveal what these policies inform stakeholders about e-learning practices in teaching and learning.
2. To assess how institutional e-learning policies in Chinese academic HEIs align with the technological and pedagogical requirements of Education Informatization 2.0 (2018-2024) and identify gaps or alignments between national directives and institutional e-learning policies.
3. To investigate how institutional e-learning policies allocate to address financial support for incorporating e-learning technologies in teaching and learning in China academic HEIs.
4. To analyze how institutional e-learning policies address faculty needs for training and development in digital literacy and pedagogical skills, and to

identify gaps in supporting their professional development.

5. To examine the extent to which institutional e-learning policies address technical support for faculty and students, and identify the challenges that arise in system integration.

### **1.5 Research Questions**

1. How are institutional e-learning policies (2018–2024) in Chinese academic HEIs constructed and presented, and what do their discursive languages reveal about e-learning practices in teaching and learning?
2. To what extent do institutional e-learning policies align with the technological and pedagogical requirements outlined in Education Informatization 2.0 (2018-2024)?
3. To what extent do institutional e-learning policies allocate to address the financial support for incorporating e-learning technologies in teaching and learning within Chinese academic HEIs?
4. To what extent do institutional e-learning policies address faculty needs for training and development in digital literacy and pedagogical skills?
5. To what extent do institutional e-learning policies address technical support for faculty and students, and what challenges arise in terms of system integration?

### **1.6 Significance of the study**

The study has several important contributions. Firstly, it aims to enhance the existing body of knowledge on e-learning policy and practices in Chinese HEIs, specifically focusing on China academic HEIs. By investigating the interaction among policy,

financial, technical and human dimension, the study aims to provide a comprehensive understanding of the gaps and challenges faced by these institutions and propose potential solutions.

Secondly, the study seeks to evaluate institutional e-learning policy between 2018 and 2024 in China academic HEIs. This is crucial as there is limited understanding of the policies designed for educational practices in these institutions. By assessing these policies, the study will provide valuable insights into their strengths and weaknesses.

Thirdly, this study intends to examine the interplay between directives of Education Informatization 2.0 and institutional e-learning policies in China academic HEIs. This investigation will contribute to a more nuanced comprehension of the enactment and ramifications of Education Informatization 2.0 directives within Chinese higher education. The findings can furnish invaluable perspectives for educators, practitioners, and administrators, enabling them to recalibrate and elevate institutional e-learning policies, ensuring these policies are efficacious, inclusive, and congruent with national educational objectives. Furthermore, this research can serve as a paradigm for other nations aspiring to institute comparable educational reforms, enriching the global dialogue on educational informatics and e-learning policy formulation.

Fourthly, the study intends to provide a detailed insights into the financial

implications, guiding institutions in refining their policies for greater resource optimization. Additionally, it can assist university administrators in developing long-term financial plans by identifying cost drivers and savings opportunities, informing decisions on resource allocation to ensure funds are directed towards the most impactful areas.

Fifthly, the study aims to explore the experience of faculty and students towards institutional support mandated by institutional policy and their effects on teaching and learning practices in China academic HEIs. This analysis will contribute to the development of more effective policies that support faculty professional development, foster student engagement, and improve learning outcomes.

Overall, the study has the potential to inform the development of effective e-learning policies tailored to the context of China academic HEIs, thereby enhancing the quality of education in these institutions. The findings may also have broader implications for other countries and institutions facing similar challenges in implementing e-learning policies and practices.

## **1.7 The operational definition of key terms**

### **Policy**

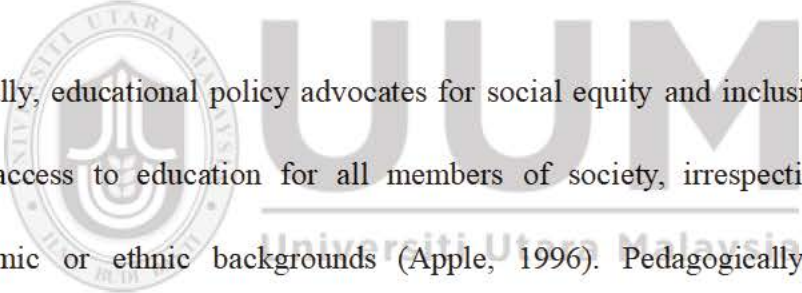
A policy is defined as a set of blueprints that direct how organizations or institutions should proceed in a particular context. A policy is a set of document-based or

non-paper-based guidelines for organizations to complete specific goals. From the perspective of Harman (1984), policies are not chaotic but systematic because policies are equal to programmed plans that are executed and followed in dealing with an identified problem. Bowe et al. (1992) state that a policy is both an ongoing process and an output when implemented. This indicates that policy development is constantly involved in the process of policy-making. Not only can policies provide strategic directions and operational procedures to achieve a goal, objective or target, but also policies play a key role in what need to be completed and ensuring the effectiveness. Navigating towards a specific goal, policies are developed as guidelines in responding to an recognized matter of concern or issue.

### **Educational Policy**

Educational policy is an umbrella term encompassing an interconnected network of principles, regulations, and directives provided by governmental bodies or institutional authorities; these guidelines function as a driving force within the educational sector, dictating its operation, and activities, and setting the standards for quality education (Taylor, et al., 1997). Within higher education, educational policy is instrumental in formulating strategic direction and operational mechanisms for universities and colleges. It steers decision-making at various levels, from institutional governance to administrative procedures, extending its influence on pedagogical practices and student support services (Sporn, 1999).

From the perspectives of the government, institutions, sociology, and pedagogy, educational policy serves multiple functions. It embodies a political statement and a societal contract, marking the state's responsibilities in delivering quality education to citizens. Educational policy involves resources allocation, setting standards, and establishing curricula (Ball, 1990). At the institutional level, it delineates strategies, structures, and processes, and determines how educational institutions fulfill their mission. This includes formulating admission policies, framing teaching and learning practices, deciding assessment and grading systems, and designing student support services (Spillane, Reiser, & Reimer, 2002).



Sociologically, educational policy advocates for social equity and inclusion, striving for equal access to education for all members of society, irrespective of their socioeconomic or ethnic backgrounds (Apple, 1996). Pedagogically, it guides instructional approaches and learning strategies, shaping curriculum choices, modes of instruction, and assessment techniques for effective knowledge and skills transmission (Cuban, 1990). One of the central roles of educational policy in higher education is to regulate quality and standards, thereby maintaining and enhancing higher education provision (Dill, 2000). It also significantly influences research and innovation within higher education institutions by directing policies related to research funding, intellectual property rights, and academic-industry collaborations (Geuna, 2001). Moreover, it addresses equity and accessibility, with policies related to admissions, scholarships, and support services impacting the socioeconomic diversity

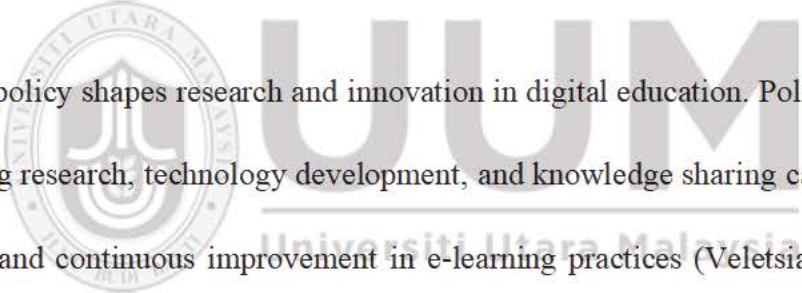
of student bodies (Marginson, 2016). Additionally, it plays a pivotal role in institutional change and development by setting strategic priorities and targets, thus stimulating universities to innovate and adapt in response to societal needs and global trends (Stensaker, Välimaa, & Sarrico, 2012).

In summary, educational policy in the context of higher education is a multifaceted tool that serves as a road map for strategic planning, maintaining quality standards, promoting inclusiveness, driving research and innovation, and fostering institutional development.

### **E-learning policy**

E-learning policy is a subset of educational policy that specifically pertains to the planning, organization, and delivery of education via digital means. It represents a coherent set of guidelines and regulations designed to ensure the effective integration and use of technology in education (Bates, 2000). In higher education, e-learning policy is instrumental in shaping the digital learning environment within universities and colleges. It serves as a blueprint that guides the design and implementation of e-learning initiatives, including online courses, blended learning programs, digital resources, and virtual learning communities (Anderson, 2008). One of the fundamental roles of e-learning policy in higher education is to set the quality standards for e-learning provision. Defining criteria for the design and delivery of e-learning, decision makers help ensure the quality of digital education and promote

best practices in online teaching and learning (Jung, 2011). E-learning policy also plays a critical role in fostering equity and accessibility in digital education. Policies related to digital access, digital literacy support, and online accommodations can facilitate inclusive e-learning environments that cater to diverse learner needs, including those of underrepresented and disadvantaged groups (Seale, 2013). Furthermore, the e-learning policy has significant implications for the pedagogical use of technology. It guides the choice of digital teaching strategies, learning platforms, and assessment methods, promoting the effective integration of technology into the teaching and learning process (Garrison & Vaughan, 2008).



E-learning policy shapes research and innovation in digital education. Policies related to e-learning research, technology development, and knowledge sharing can stimulate innovation and continuous improvement in e-learning practices (Veletsianos, 2010). Moreover, e-learning policies often catalyze institutional change. By setting strategic goals for e-learning and providing a framework for digital transformation, they can drive universities to innovate and adapt to the evolving digital landscape (Blin & Munro, 2008).

In summary, e-learning policy is an integrated part of educational governance in the digital age. It sets the direction and standards for e-learning, promotes equity and pedagogical innovation, guides research and development in digital education, and fosters institutional change toward a digitally enriched learning environment.

Table 1.5 Specific aspects of e-learning policy, strategy, and planning

Aspect	E-learning Policy	E-learning Strategy	E-learning Planning
<b>Definition &amp; Purpose</b>	Serves as a tool to integrate IT into higher education with quality control, aligning objectives with broader educational goals.	A systematic plan to enhance learning and teaching processes through electronic technologies, providing a comprehensive road-map.	Involves setting objectives, allocating resources, and designing implementation steps for e-learning integration.
<b>Scope &amp; Focus</b>	Broad, focusing on quality control, funding, and professional development.	Detailed plan focused on technology integration and utilization with an emphasis on adaptability and scalability.	Operational, dealing with specific steps, resource management, and implementation processes.
<b>Components</b>	Funding and resource allocation, professional development for educators, quality control standards, and evaluation mechanisms	Encompasses technology infrastructure, instructional design, content development, user support, feedback, and data analytics.	Needs assessment, resource allocation, policy development, implementation, and evaluation.
<b>Objectives</b>	Ensures IT integration aligns with educational goals and maintains high standards.	Provides a road-map for effective technology use to improve learning outcomes.	Focuses on practical steps and resource management for successful e-learning implementation.
<b>References</b>	Decuyper et al., 2021; European Commission, 2021; Mishra & Koehler, 2006; Bates, 2019; Quality Matters, 2022; Allen & Seaman, 2017; Jung & Latchem, 2011;	Forbes et al., 2023; Garrison & Vaughan, 2011; Bozkurt et al., 2015; Gligorea et al., 2021	Sangrà & González-Sanmamed, 2010; Goodyear, 2005; Selim, 2007; Garrison & Anderson, 2003; Laurillard, 2002;

The discourse on e-learning policy distinguishes two interrelated constructs: e-learning strategy and e-learning planning. E-learning policy, strategy, and planning each play unique yet interconnected roles (See table 1.5) in integrating IT within higher education, forming a comprehensive framework. The e-learning policy acts as a cornerstone, outlining strategic frameworks, quality control standards, funding models, professional development needs, and evaluation mechanisms to align IT integration with educational objectives. This policy establishes macro-level goals and quality assurance measures for effective IT utilization. Building on this, e-learning strategy operationalizes directives into a coherent plan, detailing how institutions will use digital technologies to enhance learning and teaching processes. It includes technology infrastructure, instructional design, user support, and adaptability, ensuring continuous improvement through feedback loops and data analytics.

E-learning planning then implements the strategy by setting specific objectives, allocating resources, and defining implementation steps. This phase involves needs identification, technology assessment, policy formulation, and crafting digital content.

Planning ensures practical and effective deployment through goal setting, stakeholder engagement, resource management, and ongoing evaluation. Essentially, policies provide the framework for formulating strategies aligned with organizational values and legal requirements, strategies outline a road-map for achieving these objectives, and planning translates these strategies into actionable steps, ensuring compliance and strategic goal achievement through precise actions and resource management (Bryson, 2018; Hill & Jones, 2013). In higher education, e-learning policy sets broad objectives and standards, e-learning strategy outlines a road-map, and e-learning planning executes the strategy through specific actions and resource allocation. In this dissertation, e-learning policy, strategy, and planning are interchangeable at China academic HEIs.

Table 1.6 Definition of critical success factors of the conceptual framework

Human factors		Description	Reference
Faculty's digital literacy	Digital literacy, a macro-level term, involves a range of abilities to deploy technology and systematic knowledge of ICT through computer usage. Faculty's digital literacy is essential for faculty's and students' acceptance of using technology in educational activities.	Mohammadyari & Singh (2015); Song, et al., (2005); Selim, (2005); Volery and Lord (2000); King and Boyatt (2014); Yengin, et al., (2011); Stickney et al., (2019);	
Faculty's pedagogical skills	Digital literacy combined with pedagogical skills are key factors that enable faculty integrate technology into educational practice. When promoting faculty's abilities, pedagogical skills should always come first and then digital literacy.		
Faculty's attitudes	Learning outcomes of students are positively associated with one faculty who has a optimistic attitude towards e-learning. Faculty's attitudes play a key role in determining students' learning outcomes. When adopting e-learning, faculty's attitudes, digital literacy and pedagogical skills are three predominant factors of instructors' characteristics.		
Students' digital literacy	As one key component of students' characteristics, students' digital literacy is examined in experimental research and is positively correlated with the successful implementation of e-learning.	Mohammadyari & Singh (2015); Song, et al., (2005); Selim, (2005); Volery and Lord (2000);	
Students' attitudes	Students' attitudes is defined as students' perception of adopting e-learning practice through deployment of digital devices. With little knowledge of learners' perception and attitudes toward e-learning, educators face hardship when implementing e-learning.		
Technical factors		Description	Reference
Technical Support System(IT Support, Help desk & Library)	IT support: The experience of adopting e-learning can be easily jeopardized when technical issues appear. The degree of technical assistance is heavily relied on the quality of support provided by technicians. A help desk is a multi-tasking resource that serve for saving students time and satisfying their needs and that document students' problems and difficulties of using e-learning at the first place. Whether libraries provide sufficient e-learning support such as computers, printers, e-learning facilities, and training for using digital library determine e-learning acceptance and success measure.	Bluic, Goodyear & Ellis, (2007); Song, et al., (2005); Venkatesh, Croteau & Rabah, (2014); Masrom, (2008); Selim, (2005); Stickney et al., (2019);	
Information Accessibility	Whether information (including e-learning guidelines) is well-structured and students know how to easily access to library websites and search for available information determine the satisfaction of learners and how students perceive e-learning.		
Easy for use (ease of use)	Ease of use pertains to the learner's capacity to easily navigate and engage with the system, as well as understand its features and functionalities without any prior knowledge or experience.		
E-learning environment	Promoting e-learning practices at universities, e-learning environment is classified into tangible and intangible one. Tangible one: the physical environment and resources available to the learner, such as the technology used, network connectivity. Intangible one: communication, interaction, and multimedia delivery.	Nejkovic & Tosic, (2018); Abdel-WAHAB ,(2008); EIDYS, 2021; Cigdem & Ozturk, (2016) Al-araibi et al. (2019); McNaught et al. (2009); Nejkovic and Tosic (2018); Stefanovic et al. (2011); Alnabhan et al. (2014)	
Financial factors		Description	Reference
Initial investment/Start-up costs	Initial investment forms the cornerstone of e-learning implementation in HEIs. Various elements come under the category of this investment, including monetary allocations, technological acquisitions, content creation, and faculty training.	(Allen & Seaman, 2017; Bates, 2015; Bacow et al., 2012; Garrett, et al., 2020; King, Dang, & Zhang, 2009; Lopes, 2018)	
Running costs/recurring costs	Running costs are a key part of the implementation and sustainability of e-learning in HEIs. These include technology maintenance and upgrades, ongoing faculty training, course design, and learner support services	(Grau-Valldosera & Minguillón, 2014; Bates, 2015; Salmon, 2011; Moore, Dickson-Deane, & Galyen, 2011; Simpson, 2013)	
Cost-effectiveness	Cost-effectiveness is a pivotal determinant in the maintenance of sustainable e-learning. Cost-effectiveness is a valuable indicator that provides information for premium financial management, which is indispensable in the process of implementing e-learning.	Chipere (2017); Mihai et al. (2021) Rovai & Downey (2010); Shelton (2011); Stansfield et al. (2009);	
Policy		Description	Reference
Macro-level policy	Governments intend to help universities not only build strength and gain competitive advantages in global communities but also seize opportunities for fund-raising and integrate computer technologies into educational programs for the betterment of domestic higher education	Roumell & Salajan, (2014);	
Institutional-level policy	From the micro-level of e-learning policy, higher education institutions aim to allocate resources for specific goals, set operational plans and run e-learning practice smoothly	Czerniewicz & Brown, (2009);	

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This comprehensive literature review consists of six pivotal components. The first component underscores the necessity of integrating e-learning into higher education, offering a thorough rationale for its essence. The subsequent section explores the pivotal role of e-learning policies in facilitating their adoption. It begins with a global perspective and emerging trends on overarching e-learning policies, investigates the research context of institutional e-learning policies, and examines the intricate interplay between macro-level and institutional e-learning policies. Additionally, this section emphasizes the primary objectives of macro-level e-learning policies in Chinese HEIs and summarizes the challenges faced by institutional e-learning policies within these institutions.

The third component provides an overview of e-learning implementation in Chinese HEIs, highlighting the current state, driving factors behind the growth of e-learning, and the obstacles faced by Chinese academic HEIs in integrating e-learning. The fourth component assesses prior research on e-learning and identifies the critical success factors necessary for effective implementation of e-learning systems, emphasizing the importance of an integrative perspective that includes financial, human, and technical considerations. Following this, the fifth component examines the attitudes of faculty members and students toward institutional support mandated

by e-learning policies.

Finally, the sixth component discusses the implications and findings derived from existing studies, revealing the relationship between e-learning implementation and factors such as policy, finance, human , and technical support. This component also establishes a solid foundation for developing a conceptual framework, identifying critical success factors embedded in various concepts and models, along with identification of theories used as analytical frameworks for interpreting data.

### **2.1.1 Definition of e-learning**

Technology, especially e-learning, is prized for its overwhelming multilateral uses embedded in HEIs. E-learning, a concept including a variety of pedagogical methods, applications of digital devices, and procedures, is a game changer in reshaping conventional learning and teaching and supplementing educational programs in higher education. Some scholars claimed that there are no commonly accepted definitions of e-learning by scholars and educators. To be specific, e-learning is defined in many distinct forms as it serves for various purposes. From the perspective of learning method, content and access, e-learning can be defined as ‘an innovative approach for delivering well-designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open, flexible, and distributed learning environment’(Khan 2005, p.3). From the

broad level, e-learning is explained as the application of digital technologies and the web to enhance quality in learning by wider access to IT infrastructures and support (European commission, 2001). From the classification of e-learning, it consists of remote learning, hybrid learning, and distributed learning (Maltz et al, 2005). From the characteristics of e-learning, it not only contains an IT-based environment and digital contents serving for different purposes, but also refers to e-learning systems that back up student-student and teacher-student interaction and institutional support that provides technical assistance and internet access (Liaw & Huang, 2003). All above definitions place a focus on what role does e-learning, a form of technology, play in higher education (See table 2.1). Overall, e-learning is a name which is employed for decoding the integration of IT-based technology into teaching and learning.

Table 2.1 The Definition and Importance of E-learning

	<b>Broad level</b>	<b>The classification</b>	<b>The characteristics</b>
<b>Definition of e-learning</b>	E-learning is explained as the application of digital technologies and the web to enhance quality in learning by wider access to IT infrastructures and support (European commission, 2001)	Consists of remote learning, hybrid learning, and distributed learning (Maltz et al, 2005). Synchronous E-learning: Real-time interactions between students and instructors (Moore, Kearsley, & Press, 2011). Asynchronous E-learning: students access material on their schedule without real-time interaction (Hrastinski, 2008).	Contains an IT-based environment and digital contents serving for different purposes, refers to e-learning systems that back up student-student and teacher-student interaction and institutional support that provides technical assistance and internet access (Liaw & Huang, 2003)
	<b>A game changer</b>	<b>A critical role</b>	<b>An engine</b>
<b>Importance of implementing e-learning at universities</b>	In the evolution of higher education (Anderson, Boyles, & Rainie, 2012; Baer, 1998; Cookson, 2000; Waller, et al., 2019; Rooney, 2003)	E-learning successfully-applied in higher education can not only provide more accessible learning opportunities to greater number of individuals in different social status, but also give universities core competency for attracting international students while driving universities to enlarge the number of courses and enrich course contents (Garrison & Kanuka, 2004; Kirkwood & Price, 2013; Klein & Ware, 2003; Waller, et al., 2019; Renes & Strange, 2010; Rooney, 2003).	For increased learning performance and quality improvement in higher education (AI-Qahtani & Higginst, 2013; Bere, Deng & Tay, 2018; Kim, et al, 2012; López-Pérez, et al, 2012; Marti'nez-Caro, et al, 2014; Ozkan & Koseler, 2009).

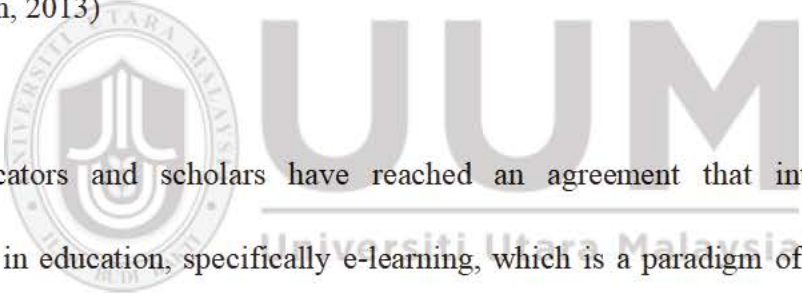
### 2.1.2 Importance of e-learning in higher education institutions (HEIs)

E-learning has been valued as a game changer, critical role, and an engine in the

metamorphosis of higher education (See table 2.1). Technology has long been considered as a game changer in the evolution of higher education (Anderson, Boyles, & Rainie, 2012; Baer, 1998; Cookson, 2000; Waller, et al., 2019; Rooney, 2003). Technology is prized for its significant multilateral uses embedded in higher education. At the inception of implementing technologies, tertiary education institutions build information infrastructure provided computer network services to all internet users on campus and off campus (Baer, 1998). Universities take advantage of this technology for administrative procedures and supplement conventional education programs (Linda, 2000). Technology also can be used as an efficient way to strengthen teaching methodologies and enrich learning experience in undergraduate programs while engendering versatile forms of online study and collaboration (Milliken & Barnes, 2002). Besides these functions, technology not only serves as a bridge to develop a strong tie between universities and enterprises or form a university-corporate partnership (Glenn, 2008), but also contributes to the establishment of online communities and worldwide academic database so that many universities can proactively respond to globalization and facilitate the communication among scholars from different countries and regions (Waller, et al., 2019).

Among various forms of internet-based technologies used in universities, e-learning has been discussed and studied frequently for its critical role played in higher education (Garrison & Kanuka, 2004; Kirkwood & Price, 2013; Klein & Ware, 2003; Waller, et al., 2019; Renes & Strange, 2010; Rooney, 2003). These studies indicated

there is a consistent evidence that e-learning successfully-applied in higher education can not only provide more accessible learning opportunities to greater number of individuals in different social status, but also give universities core competency for attracting international students while driving universities to enlarge the number of courses and enrich course contents. Further benefits of e-learning discovered in these studies also demonstrated that effective e-learning practices can bring higher return on investment and research the way that technological innovation uses to re-engineer all dimensions of education. Other than these advantages that e-learning brings to higher education, e-learning can be an effective method for delivering higher education (Bell & Federman, 2013)



Many educators and scholars have reached an agreement that internet-based technology in education, specifically e-learning, which is a paradigm of technology applied in learning and teaching, can work as an engine for increased learning performance and quality improvement in higher education (Al-Qahtani & Higginst, 2013; Bere, Deng & Tay, 2018; Kim, et al, 2012; López-Pérez, et al, 2012; Martí'nez-Caro,et al, 2014; Ozkan & Koseler, 2009). For instance, some research points out that with deep understanding of impact that ever-updating internet-based technologies exert on users, universities have designed various models and mechanisms, mounting e-learning opportunities and e-learning benefits and discovering that implementation of e-learning with fitting measures in HEIs makes contribution to improvement of education programs (Bere, Deng & Tay, 2018; Kim, et

al, 2012; Martı́nez-Caro,et al, 2014). Other empirical studies of e-learning identify that from university students' perceived satisfaction, e-learning acts as an invaluable tool for elevating learning performance (Al-Qahtani & Higginst, 2013; López-Pérez, et al, 2012; Ozkan & Koseler, 2009).

## **2.2 Overview of E-learning Policy in HEIs**

### **2.2.1 Research context of macro-level e-learning policy in HEIs**

Before e-learning gained widespread recognition as a transforming force in higher education in the world, a few nations and bodies had already devised and implemented e-learning policies or strategies to enhance their tertiary education systems. Recognizing the immense potential of e-learning in higher education, American universities took a pioneering role and advanced the development of e-learning strategies on a broader scale, nation-wide level. Directing on the reestablishment of its leading role globally, the United States conveyed its urgency in the development of e-learning policy, which emphasized on the need for increased financial resources and other support from the federal government (Roumell & Salajan, 2016).

Following the footsteps of America, the European Union also demonstrated a strong interest in promoting e-learning. It began adopting e-learning strategies guiding the implementation of e-learning to achieve two primary objectives. Firstly, there was a need to upgrade the population's skills in meeting the challenges of the knowledge

economy. Moreover, there is a pressing demand for an expanded reach of higher education to cater to the evolving dynamics of society and the enduring thirst for lifelong learning among individuals (Anderson, et al, 2006).

Based on an extensive study examining how nations respond to e-learning and establish discernible patterns in policy development (Brown et al., 2007), countries and unions like the United Kingdom, the European Union, Canada, Australia, and New Zealand formulated e-learning policies that aimed to foster a cutthroat knowledge-driven economy. Designing e-learning policy, these nations demonstrated a shared commitment to establishing a vibrant and intellectually advanced economic landscape through implementing e-learning.

Along with the trend of incorporating e-learning into higher education and scheduling e-learning policy development globally, China endeavors to not only enhance students' digital literacy but also cultivate an enabling environment that empowers them to thrive in the information age. Furthermore, China seeks to leverage technologies for academic research and enhance student administration. The development of e-learning policy in China assumes the utmost significance in China's ongoing pursuit of educational modernization(MOE, 2022).

In a word, while the United States and the European Union demonstrated similar interests in promoting e-learning in their high education sectors, the specific

objectives and strategies varied slightly. The focus in the United States was on reestablishing global leadership and securing increased support, while the European Union emphasized skills upgrading and expanding access to higher education. Additionally, other countries such as the United Kingdom, Canada, Australia, and New Zealand joined the movement toward a knowledge-based economy through e-learning policies. More importantly, China also recognized the urgency of promoting e-learning while embedding e-learning policy in their overall educational policy, aiming to transcend both local and global boundaries. The shared commitment to leveraging e-learning for economic growth and educational advancement is evident across these nations and unions.

### **2.2.2 Research context of institutional e-learning policy in HEIs**

The embrace of e-learning in Higher Education Institutions (HEIs) worldwide has ushered in a significant transformation in educational delivery. While technology has enabled this shift, the institutional policy surrounding e-learning plays an equally decisive role. This part will critically analyze the diverse e-learning policies across universities worldwide, addressing their objectives, strategies, and associated challenges.

A cornerstone of e-learning policies globally is their objective alignment and institutional strategy. There is an overarching emphasis on amplifying access to education, nurturing a continuous learning environment, and striving for global

academic excellence (Daniel, 2012). Nevertheless, there are stumbling blocks when institutions foreground international collaborations or tech integration, sidestepping the importance of local relevance and accessibility (Marginson, 2017).

An area of pronounced variation among HEIs is infrastructure and technology accessibility. Advanced regions, boasting state-of-the-art tools and platforms, starkly contrast with developing areas grappling with rudimentary technological accessibility and infrastructure (Jung & Latchem, 2012). Even as policy frameworks in these regions chase collaborations with tech behemoths, NGOs, or governments, concerns hover over the longevity and sustainability of such alliances (Unwin, 2015).

Pedagogical considerations are pivotal when adopting e-learning policies (Rosenberg, 2007). E-learning goes beyond traditional teaching methods, requiring asynchronous interactions, a learner-centered approach, and content specifically designed for digital platforms (Bates & Sangrà, 2011). This digital shift offers the advantage of personalized and accessible education. However, it also necessitates learners to be more proactive in their education, while educators must continuously evolve within the digital realm (Choudhury et al., 2023; Padhi et al., 2021). Importantly, e-learning aims to enhance, not replace, traditional methods, combining the strength of both approaches to foster a holistic learning environment (Pankratova et al., 2020).

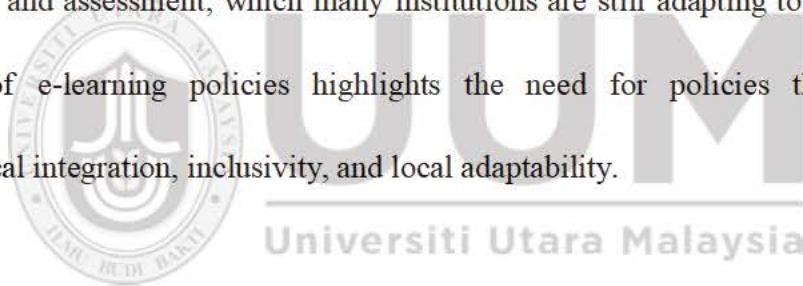
Ensuring the quality of e-learning is non-negotiable, quality assurance and accreditation policies are paramount. With e-learning pedagogy deviating from traditional yardsticks, existing evaluation mechanisms often fall short. Consequently, there is a fervent effort to architect innovative assessment strategies (Mays, 2005). Nonetheless, a consensus eludes HEIs on the standardization of these metrics and the equivalence between e-learning and traditional degrees (Uvalić-Trumbić & Daniel, 2014).

Faculty development and support remain vital for a seamless e-learning transition. Equipping faculty with the nuances of e-learning tools and the attendant pedagogical shifts is pivotal. While there is discernible momentum in certain HEIs toward this end (Vaughan, 2010), discrepancies abound in the training's quality and reach, leading to inconsistent e-learning delivery (Bolliger & Wasilik, 2009).

Further, policies need to prioritize student support and engagement. Beyond content delivery, the policy framework must emphasize fostering an engaged, motivated student community in the virtual realm. While some institutions are steering toward interactive spaces, peer collaborations, and regular feedback (Moore, 2013), many are still wrestling with the challenge of standardized digital learning (Aslam, et al., 2023; Gillespie, 2022).

Although e-learning policies in HEIs aim to create accessible, high-quality, and

globally competitive learning environments, there is significant variation in how these policies are implemented and their outcomes. This variation leading to regional disparities in technological infrastructure, differences in institutional priorities, and varying levels of faculty and student support. For instance, HEIs in technologically advanced regions are more likely to have effective e-learning platforms, while those in developing areas face challenges due to limited infrastructure. Policies emphasizing international collaborations or high-tech integration may overlook local needs, making accessibility and relevance key issues in some contexts. Furthermore, although e-learning offers flexibility and personalization, it requires new approaches to teaching and assessment, which many institutions are still adapting to. The global diversity of e-learning policies highlights the need for policies that address technological integration, inclusivity, and local adaptability.



### **2.2.3 The importance of institutional e-learning policy in HEIs**

E-learning policy, an operational framework, functions as an essential instrument to facilitate the integration of Information Technology (IT) into higher education and to ensure stringent quality control of its execution. Such policy, with clarity, typically delineates strategic frameworks that guide IT integration within educational practices. As Decuyper et al. (2021) elucidates, e-learning policy, if well-established and robust, often articulates clear objectives that align with broader educational goals, thereby ensuring that IT integration is purposeful and conducive to academic excellence. For example, the European Commission's Digital Education Action Plan, macro-level

policy, underscores the significance of cultivating digital skills and competencies among both educators and students (European Commission, 2021). Effective e-learning policy, also, encompasses provisions for funding and resource allocation. Robust funding models that support the acquisition of requisite technologies and the training of staff are indispensable for the successful integration of IT. It is vital to know that Mishra and Koehler (2006) assert that adequate funding enables institutions to adopt and sustain new technologies, thereby augmenting teaching and learning experiences. Professional development, on the other hand, is another pivotal component addressed by e-learning policy. Apparently, e-learning policy that mandates continuous training for educators bolsters their capacity to effectively employ IT in their pedagogical practices. It is also critical to know Bates (2019) posits that professional development initiatives should emphasize both technical skills and pedagogical approaches to ensure educators can integrate IT in ways that enhance student learning. E-learning policy also establishes standards and guidelines to ensure quality control in the implementation of e-learning. Collectively, these standards typically include criteria for course design, delivery methods, and assessment techniques. For instance, the Quality Matters program offers a set of standards for designing high-quality online courses, ensuring consistency and rigor in e-learning environments (Quality Matters, 2022).

Regular assessment and evaluation, no doubts, are critical for maintaining the quality of e-learning initiatives. It is obvious to see that e-learning policy that incorporate

mechanisms for ongoing evaluation enable institutions to monitor the effectiveness of their e-learning programs. Allen and Seaman (2017) highlight that such evaluations can inform continuous improvement efforts, ensuring that e-learning remains pertinent and efficacious. Accreditation and certification processes, also, play a significant role in quality control. E-learning policy that includes provisions for accreditation ensure that online programs meet established standards of quality. Jung and Latchem (2011), then, contend that accreditation not only enhances the credibility of e-learning programs but also provides assurance to students and employers regarding the quality of education delivered online. It is also vital to see that sophisticated e-learning policy is pivotal for the efficacious facilitation of e-learning practices. Well-established e-learning policy acts as a fundamental pillar for the successful adoption and integration of e-learning within educational systems (Czerniewicz & Brown, 2009; Hu & Raman, 2024; O'Connor, 2014; Roumell & Salajan, 2014; Roumell & Salajan, 2016). It, sophisticated e-learning policy, establishes a structured framework that significantly influences the acceptance and proficient implementation of e-learning initiatives (Pittard, 2004; Czerniewicz & Brown, 2009).

Well-articulated e-learning policy enhances the implementation process by providing clear guidelines for embedding e-learning into educational activities (Roumell & Salajan, 2016). Furthermore, continuous updates to e-learning policy, informed by practical implementation experiences, create a feedback loop that persistently bolsters

the effectiveness of e-learning (Passey et al., 2006; Roumell & Salajan, 2014). E-learning policy is indispensable for promoting the adoption and assimilation of innovative e-learning approaches across universities, thereby enabling them to maintain relevance and competitiveness in the global knowledge economy (Roumell & Salajan, 2016). At the institutional level, e-learning policy is crucial for establishing operational frameworks and ensuring the judicious allocation of resources essential for fostering a conducive environment for e-learning (Czerniewicz & Brown, 2009; De Freitas & Oliver, 2005). The synergy between e-learning policy and its implementation not only shapes the strategic and structural dimensions of education but also affects the methodologies employed to achieve educational objectives in the contemporary digital era (Liu-Schuppener, 2023).

A comprehensive institutional e-learning policy, in summary, should include several key elements to ensure its effectiveness and sustainability. These elements encompass a clear mission and vision for e-learning, along with strong security and privacy measures to protect data. The policy should promote accessibility and inclusion, ensuring equitable access for all learners, and establish a reliable course delivery system supported by high-quality course design and development. Faculty training, student support services, and transparent assessment and feedback mechanisms are essential for fostering an engaging and supportive learning environment. Clear certification policies, ownership of intellectual property, and regular course evaluations further ensure quality and consistency. Additionally, the policy should

incorporate emerging e-learning technologies, such as Artificial Intelligence (AI) and Augmented/Virtual Reality (AR/VR), to enhance the learning experience.

#### **2.2.4 The interplay between Macro- and Institutional e-learning policy**

It is critical to see that the interplay between macro- and institutional-level e-learning policies is complex and multifaceted, with effective alignment being crucial for the successful implementation of e-learning initiatives. Several challenges, however, can hinder this alignment, such as a lack of coherence and integration, which can lead to fragmented e-learning practices if national policies, macro-level policy, advocate for widespread technology adoption while institutions, universities, struggle with inadequate resources or infrastructure (De Freitas & Oliver, 2005). It is vital to know institutions often require autonomy to tailor e-learning policies to their specific needs, but too much divergence from macro-level policies can result in inconsistencies and reduced overall effectiveness (Goeman, 2006). Adequate funding and resource allocation, with caution, are essential, as discrepancies can exacerbate inequalities in access to digital education (Parchoma, 2006). Further, best practices for effective policy alignment include engaging stakeholders in collaborative decision-making to enhance coherence and mutual understanding, investing in capacity building for educators and administrators to facilitate policy implementation, and establishing mechanisms for continuous evaluation and feedback to identify gaps and adapt to changing needs (McNaught & Vogel, 2006). Not surprisingly, a combination of top-down and bottom-up approaches, such as mutual coordination between

macro-level European policies and micro-level institutional policies in Flanders, enhances policy implementation through regional specificity and autonomy (Adrian, 2007; Goeman, 2006). Emphasizing knowledge management, resource-sharing, and cross-functional collaboration, particularly, can help overcome financial risks and organizational structure constraints, while aligning policies with university culture and supporting both innovation and the abandonment of outdated practices (Rosenberg, 2007; Cook et al., 2007). Further studies indicated that focusing on diverse and informed viewpoints in policy-making prevents technologically deterministic perspectives from dominating, with middle-out management strategies emphasizing partnerships and collaboration among stakeholders being particularly effective (Chikuni, 2017; Roushan et al., 2016). A number of studies revealed that prioritizing digital learning and technology-enabled pedagogy, along with competency-based frameworks, can enhance student engagement and satisfaction (Moore, 2012; Abdous, 2019; Rajabalee & Santally, 2021).

#### **2.2.4.1 Policy Implementation and Institutional Theory in HEIs**

As the above section centered on the interplay between national directives of Education Informatization 2.0 and institutional e-learning policies, this part will provide insights into why academic HEIs in China may mirror or resist the practices associated with the Double-First-Class universities. Two related aspects will be discussed: Alignment (The promise of coordinated governance) & Misalignment (The persistence of symbolic compliance).

*Alignment: The promise of coordinated governance*

China's higher-education policymakers have long sought to turn sprawling bureaucracies into disciplined instruments of reform. Over the past decade, governance reforms have tightened the circuitry between Beijing, provincial authorities and universities, giving rise to a more performance-oriented order. Mok (2017) notes that accountability loops, performance metrics and administrative audits have created a system in which institutions are incentivised—sometimes compelled—to echo national objectives. This web of coordination, the researcher argues, enables universities to enact national directives more efficiently than before.

That same logic underpins the evolving trajectory of China's e-learning policy. Xiong, et al (2022) trace the shift from early pilot initiatives to a phase of standardisation, followed by transformation and governance improvement. Each stage, they contend, reflects a maturing policy ecosystem that has clarified institutional roles and codified alignment mechanisms. Under this architecture, national ambitions such as the Education Informatization 2.0 Action Plan (2018–2024) no longer hover as abstract slogans; they are woven into funding schemes, leadership appraisals and infrastructure planning.

More recent investigations support the alignment narrative. For instance, the study of internal governance structures in “Double First-Class” universities by Gao, et al (2022)

reports that elite HEIs have formalised governance boards, refined administrative pathways, and streamlined faculty decision-making—moves intended to enable clearer institutional alignment with national priorities. They conclude that universities are increasingly operating within standardized templates of governance, thereby facilitating top-down translation of policy.

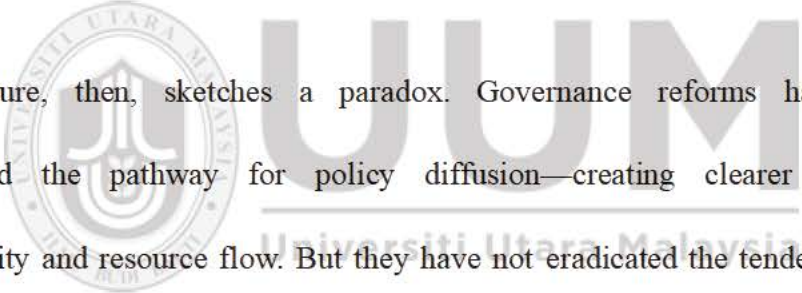
In this optimistic view, institutional alignment is less about bureaucratic obedience than about capacity: the ability of universities to interpret, translate and embed national directives into their own strategic frameworks. Governance reforms, in this telling, have created the administrative muscle and incentive structures to make such translation possible—if not always uniform. As one senior minister recently remarked at a conference, pilot programmes are “key levers to validate and stress-test reform measures” (Ministry of Education press-release, March 2025).

*Misalignment: The persistence of symbolic compliance*

Yet a more sceptical literature indicates that alignment in China’s higher education remains as much theatre as substance. Behind the formal coherence of strategic plans and glossy policy reports, deep-seated institutional inertia persists. Xu (2021) observes that governance reforms still privilege expansion and administrative control over genuine pedagogical renewal. Many universities, the Chinese scholar indicates, comply symbolically—establishing the “Department of Education Informatization” or adopting e-learning strategies that tick the right bureaucratic boxes but leave

classroom practices largely untouched.

Institutional theory offers a vocabulary for this gap. Under coercive and normative pressures, organizations often mimic policy form to signal legitimacy, even when internal structures resist change (DiMaggio & Powell, 1983). Thus, Chinese HEIs may produce a semblance of digital modernity—policies, task forces, platforms—without altering the underlying incentive systems that support faculty professional development. The result is an alignment of appearance rather than of practice: a policy cycle that concludes with infrastructure rather than pedagogy.



The literature, then, sketches a paradox. Governance reforms have indeed strengthened the pathway for policy diffusion—creating clearer routes of accountability and resource flow. But they have not eradicated the tendency toward symbolic alignment and uneven implementation. For researchers examining “alignment” in institutional e-learning policies, the task is therefore not to count policies but to scrutinize their governance architecture: who drives them, how incentives operate, and whether the policy logic is genuinely internalized or merely displayed for legitimacy’s sake.

Among the recent contributions, the discourse on the construction of “high-level talent” in the Double First-Class Initiative (Zheng & Li, 2025) shows how the same policy tools may serve legitimizing functions as much as substantive ones, reinforcing

the need for institutional-theory framing to detect misalignment. Ultimately, the presence of policy instruments or infrastructure may mark the form of alignment—but the deeper question is whether institutions have transformed their function and logic accordingly.

## **2.2.5 Macro-level & Institutional e-learning policy in China HEIs**

### **2.2.5.1 Macro-level e-learning policy in China HEIs**

China, a top-down governed regime, has been traditionally viewed as a typical example of a centralization-oriented nation. Education in China, in general, works as an engine for both booming economic development and expanding the Beijing government's ideology (Li, 2017). However, after the economic reform, open-market-oriented policy, introduced in the beginning of the 1980s, decentralization started to play an increasingly important role in educational policies of China. Since then, the Beijing government has empowered provincial governments and city councils with delegation and devolution. After 2000, educational policy, from the macro-level, has not been particularly regulated by the central government, and specifically no operation-oriented policy has been individually framed for the incorporation of e-learning into China HEIs. The role that the central government of China play in educational reform is a coordinator rather than a direct controller (See table 2.1). The Beijing government shifts its focus to coordinating the relations among central, provincial, and local governments and to supporting a free-market mechanism which balances the needs of society with the supply of educational services and

resources. A variety of responsibilities the central government shoulder in educational policies include: picturing a holistic vision for educational technologies, framing a long-run, strategic plan for leading nation-wide actions, setting a well-performed e-learning system embedded in one particular university as an example, providing financial support on the research and development agenda for resolving issues of educational technologies (Li, 2017).

Table 2.1 Governmental Jurisdictional Hierarchy

Level of Governments	Responsibilities falls under different level of governments in educational reform
<b>The Central Government</b>	Since 2000, the central government of China has played a coordinating rather than controlling role in educational reform, and no specific, operation-oriented policies have been framed for the incorporation of e-learning into higher education institutions (Li, 2017).
<b>Provincial Governments</b>	Provincial governments in China oversee and support the development and implementation of e-learning policies in universities, allocate financial resources, and supervise through policy documents rather than direct decision-making, ensuring alignment with set objectives (He, 2014; Yan, 2020).
<b>City Councils</b>	While universities in China are managed and funded by provincial and autonomous regional authorities, they lack a formal organizational connection with city councils, which does not integrate higher education development into its official responsibilities (Yang & Feng, 2015).

As the central government of China takes the lead in guiding higher education institutions, the primary responsibility for overseeing whether these universities successfully achieve their educational goals rests with individual provincial governments (See table 2.1). Each province is responsible for overseeing and supporting the development and implementation of e-learning policies for universities within its jurisdiction (He, 2014). According to Yan's study (2020), a significant 70.39% of all educational policy documents were issued by provincial education departments between 2017 and 2019, highlighting their pivotal role. These educational departments allocate financial resources to universities, and grant them the autonomy to adapt e-learning policies to specific needs of faculty and students (Yan, 2020). However, rather than direct involvement in decision-making, provincial

governments use policy documents to supervise universities. They set regulations and standards to ensure universities align with their outlined objectives. Each provincial government has also introduced a system of symbolic credentials (Li, 2005), linking them through administrative documents to foster a network of recognized achievements (Qiao, 2013). Chinese universities, including Double-First-Class universities and academic HEIs, are incentivized to compete for these limited credentials, which can lead to benefits like the autonomy and additional funding. To ensure universities adhere to these standards, provincial governments has employed three strategies: Establishing consensus-driven guidelines to standardize information dissemination and set quality benchmarks; Monitoring universities through onsite inspections to ensure compliance; Evaluating university performance against set milestones, using tools like evaluations and certifications to confirm they achieve their goals (Yan, 2020). In China, Double First-Class universities receive robust support from the Ministry of Education through initiatives such as the 985 and 211 Projects and the Double First-Class Initiative, alongside funding from provincial and local governments. On the other hand, academic HEIs, mainly funded by provincial governments, must compete for these prestigious credentials to secure essential funding for education and research. However, city governments are not directly responsible for fostering or advancing higher education within their regions (Yang & Feng, 2015). In sum, to establish systematic institutional e-learning policy for academic HEIs stems from a need to balance local autonomy with overarching national priorities. The central government's coordinating role and provincial

governments' funding role suggest that institutional stakeholders have certain freedom to shape e-learning policy in their contexts, but national guidelines and objectives for embracing e-learning still have an influence on institutional e-learning policy.

In China, e-learning policies in HEIs are embedded in the context of educational policies, which set targets and goals for facilitating e-learning implementation in teaching and learning throughout the country. The policy of incorporating technologies into higher education is twofold. To begin with, China aims to promote students' digital literacy and foster a conducive environment which allows students to perform well in the information age. Secondly, to employ technologies in conducting academic research and upgrading students administration and to develop digital contents and resources are particularly essential for China's modernization of education (MOE, 2022). In table 2.2, adoption of e-learning policies in higher education in China can be classified into two stages: Education Informatization I & II. In China, Education Informatization is interchangeable with the scholarly accepted term e-learning and digital transformation.

Table 2.2 Timeline & historical policy of e-learning in China

NO.	Date	China's Macro-level E-learning Policy
01	1998 MOE	Education promotion plan of action for the 21st Century
02	2001 MOE	Network among school projects
03	2002 MOE	Campus Computer network construction at universities in western China
04	2002 MOE	Educational Informatization: 10 <sup>th</sup> five-year plan for ICT in Education
05	2004 MOE	Modern Distance Education Project in Rural elementary and Secondary schools
06	2010 MOE	Outline of the national medium- and long-term PLAN for education reform
07	2012 MOE	10 year development plan of ICT in education (2011-2020)
08	2015 MOE	Development of MOOCs & Deployment of e-learning tools in Higher Education
09	2016 MOE	2016 Summary of Education Informatization I
10	2016 MOE	Educational Informatization: 13 <sup>th</sup> five-year plan for ICT in education
11	2016 CPC&SC	China's Modernization of Education in 2035
12	2018 MOE	Action plan for Education Informatization II
13	2022 MOE	2022 Outline of Education Informatization II

Source: (MOE: Ministry of Education; CPC&SC:  
General Office of the CPC central committee & the State Council)

First stage of incorporating e-learning into higher education in China is Education Informatization I. This stage started from the year of 1998 to the year of 2016, of which 1998-2010 is the construction-driven period. During the period, the central government placed a great emphasis on building internet facilities through network among schools project (MOE, 2001), universities campus computer network construction project in western China (MOE, 2002), and modern distance education project in rural elementary and secondary schools (MOE, 2005). From the year of 2010 to the year of 2016, the central government centered on not only establishing campus-to-campus broadband network, premium digital learning material, online learning platform, open online courses platform, and public information management system (three links and two platforms), but also enacting e-learning practice through the use of these e-learning systems. Owing to the fact that the project of three links and two platform has been fully completed since the 18th National Congress of the Communist Party of China launched, China's Education Informatization I has reached unprecedented accomplishments in IT infrastructure and introducing of e-learning.

However, Education Informatization I did not consider three factors. First, the policy merely added technology to previous teaching methods instead of fully integrating it, which reinforced traditional educational practices rather than modernizing them. Second, there was a disproportionate emphasis on top-level management over the real-world needs of teachers and students, causing administrative goals to interfere

with effective teaching. Finally, the initiative aimed at information management rather than guiding the strategic use of technology in education, missing an opportunity for a more collaborative and effective approach (Ren, 2018).

Second stage, Education Informatization II (See table 2.3), started to launch from the year of 2018. Currently, education reform aimed at modernizing education in China remains on this stage. In the stage of Education Informatization II, educational policies in China shifts its focus from incorporating e-learning into education to developing frontier e-learning systems and models, which aim to contribute Chinese intelligence and problem-solving insights to the development of global education informatization and establish an educational power (MOE, 2018). A long-term strategic plan, “China’s modernization of education in 2035”, launched for accelerating the process of Education Informatization, building smart campuses, and monopolizing resources for integration of e-learning system that includes instruction, administration, and public education service (CPC&SC, 2019). In 2022, the Ministry of Education in its briefs highlighted the need to build a systematic standard for evaluating e-learning practice, to establish a benchmark for introducing e-learning products and services on campuses, and to set a well-established e-learning system embedded in educational institutions as an example for HEIs.

Table 2.3 Major Focus of Education Informatization II

Major Focus	Description
Deep Integration between Technology and Education	Aims to embed technology within education systems in a way that effectively supports and enhances pedagogical objectives, rather than just adding technology as an accessory to existing structures.
Transition from 'Management' to 'Governance' Model	Shifts from a top-down management approach to a governance model, encouraging diverse stakeholder participation—including government, schools, families, businesses, and community organizations—in educational decision-making, thereby making the system more inclusive and responsive.
Balance Between Prioritizing Administrative goals and Classroom Needs	Seeks to align high-level administrative objectives with the practical needs of teaching and learning in classrooms, addressing past gaps where the focus on policy often overlooked the quality of education delivered directly to students.

Source: (MOE, 2018)

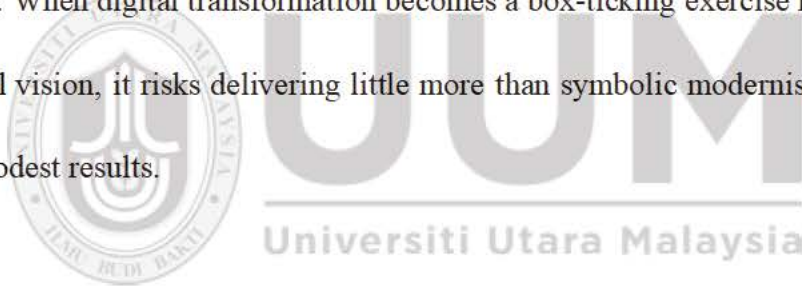
Education Informatization II in China represents a practical and forward-looking evolution over its predecessor-Education Informatization I (Ren, 2018), with three central goals in mind. First, it aims for a deep, two-way integration between technology and education, moving beyond simply adding technology to existing systems to ensure that it effectively serves pedagogical goals. Second, it transitions from a 'management' model to a 'governance' model, thereby involving a diverse range of stakeholders — such as government, schools, families, businesses, and community organizations—in the decision-making process to make the educational system more inclusive and responsive to societal needs. Lastly, it seeks to establish a balance between top-level administrative priorities and actual educational needs, rectifying past imbalances that often neglected the quality of teaching and learning at the classroom level. Education Informatization II aspires to create a more integrated, inclusive, and balanced educational environment (Hu & Zhang, 2018).

In general, the two phases of Education Informatization are well-structured, yet they exhibit some shortcomings. First, the term 'Education Informatization,' although central to the transformation process, lacks specificity. This vagueness could potentially lead to ambiguities concerning the true scope and objectives of digital transformation within educational systems, thereby impeding the enhancement of educational quality. Second, while policy documents explicitly outlined long-term objectives, there appears to be a lack of emphasis on short-term, phased goals. The absence of these interim milestones could compromise the effective realization of long-term ambitions.

#### **2.2.5.2 Institutional e-learning policy in China HEIs**

At the institutional level, the promise of China's Informatization 2.0 strategy remains unevenly fulfilled (Hu & Zhang, 2019; Lei, 2018; Wang & Gao, 2018). Chinese universities still tuck their IT or digital transformation offices into administrative backrooms, treating them as service departments rather than engines of educational innovation. Most remain preoccupied with keeping the digital lights on—maintaining infrastructure—rather than rethinking how technology might reshape teaching and learning. The result is a patchwork of siloed systems, poor interoperability and duplicated projects: a technocratic rather than pedagogical model of change (Hu & Zhang, 2019). Universities keep building more but integrating less, expanding their digital estates without transforming how knowledge is created or shared (Wang & Gao, 2018).

Beneath the surface, institutional inertia runs deep. Analyses drawing on systems theory and institutional isomorphism suggest that universities have yet to see digital transformation as a core driver of educational reform (Hu & Zhang, 2019). The real challenge lies not in better software or smarter tools, but in overhauling governance, incentives and decision-making. Bureaucratic habits—visible in performance metrics, funding allocations and rigid hierarchies—still stifle experimentation. Meanwhile, tensions around platform centralisation, data-heavy management and shifting academic roles erode trust and effectiveness (Hu & Zhang, 2019; Lei, 2018; Wang & Gao, 2018). When digital transformation becomes a box-ticking exercise rather than a pedagogical vision, it risks delivering little more than symbolic modernisation: shiny systems, modest results.



In China HEIs, there is a pressing need, critically and collaboratively, for a more strategic and coordinated approach to Education Informatization. One significant issue is that most HEIs lack comprehensive planning at the institutional level, often treating informatization as a secondary priority. This fragmented approach, deliberately, leads to redundant information systems across departments, wasting valuable resources (Huang & Dai, 2021). National-level projects like the 'Three Communications' and National Quality Video Open Courses have spurred action at grassroots levels but have not adequately incentivized innovative practices. As a result, there is little organized effort for large-scale educational practice and collaborative

innovation (Cheng & Wang, 2017).

The disconnect extends to e-learning policies, which are often lost within broader educational strategies, owing to a lack of tailored, institution-specific e-learning policies (Cheng & Wang, 2017; Huang & Zhang, 2023; Shi, 2020). This problem is exacerbated by insufficient leadership training in digital education and a general misunderstanding of what e-learning policies should entail (Liang, 2015; Sun, 2011; Szeto, 2013). A number of studies indicate that educators and decision-makers, consequently, are left to devise e-learning policies based on their limited understanding, leading to inconsistencies that affect resource allocation, faculty training, and student engagement (Zhong et al., 2017). Two studies also revealed that the absence of a coordinated policy-making effort between central government and China HEIs, further, complicates this scenario, resulting in inconsistent policies and challenges in implementation (Liang, 2015 & Shi, 2020).

Education Informatization in China HEIs, in summary, suffers from a lack of comprehensive planning, ineffective incentive structures for innovation, and a disconnect between overarching and institutional e-learning policies. These issues, combined with inadequate leadership training and understanding of e-learning, result in fragmented and often ineffective approaches to implementing e-learning.

The interplay between macro-level policy and institutional adaptation cannot be fully

understood without considering the broader digital transformation context shaping higher education. The following section outlines five thematic forces—digital transformation, AI, platformisation, datafication, and post-pandemic pedagogy—that together reveal the momentum and contradictions defining the Chinese higher education sector.

### **2.2.5.3 Thematic Landscape of Digital Transformation in China HEIs**

The Chinese higher learning sector is undergoing a profound digital upheaval. What began as the hasty digitisation of lecture halls has evolved into something more strategic. The digital transformation of universities now spans infrastructure upgrades, analytics, faculty upskilling and the redesign of pedagogy. Yang (2022) suggests that digital transformation in higher education extends beyond the simple adoption of technological tools, emphasizing instead the importance of identifying strategic areas and implementing targeted initiatives to advance e-learning in teaching and learning. The MOE of China enthusiasm has been matched by a national policy drive: Ding & Wu (2024) show how “smart classrooms”, “smart campuses” and big-data teaching pilots have become hallmarks of this state-led experiment. Yet for all the investment, many university strategies still prize efficiency over imagination. Xiao (2023) finds that the “14th Five-Year Development Plans” of leading Chinese universities echo Western rhetoric on Education Modernisation but remain largely managerial in tone—a reminder that technological ambition does not always translate into pedagogical renewal.

A second wave of transformation comes from artificial intelligence (AI). What once looked like hype now defines the research frontier. Nihayah et al. (2024) notes that across China, India and Indonesia, teacher-training institutions struggle with the prosaic obstacles of infrastructure, skills and governance. Case studies such as Jia (2024) reveal both promise and peril: intelligent tutoring systems and predictive analytics are spreading, but management and ethical safeguards lag behind. Globally, scholars are less sanguine about AI's role in assessment. Bulut et al. (2024) warn that while algorithms can generate instant feedback, they also risk entrenching opacity, bias and unfairness. The task for universities is to balance efficiency with accountability before the machines start marking their makers.

A third trend, the platformisation of higher education, is quietly reshaping governance itself. Universities now rely on a web of commercial platforms—LMSs, MOOCs, analytics dashboards and proprietary clouds. These tools promise scale and personalisation, but at a cost: vendor lock-in (Opara-Martins et al., 2016), data extraction (Stewart et al., 2023), and creeping surveillance (Gourlay, 2024). Institutions that once prized academic autonomy now find themselves negotiating contracts rather than curricula. Closely tied to this is the ethics of datafication. Learning analytics and predictive models of student performance are spreading fast (Jones, 2019), but so are questions about consent, privacy and the institutional duty of care.

Finally comes the lingering question of post-pandemic pedagogy. The COVID-19 crisis forced universities online (Haywood et al., 2023); its aftermath is forcing them to decide what to keep (Ulla & Perales, 2022). Some have embedded hybrid models and flexible assessment; others have simply reverted to pre-2020 habits (Wang et al., 2024). The global debate now centres on sustainability: which e-learning practices truly improve learning, and which merely digitalise old inefficiencies?

Overall, these five themes reveal both momentum and contradiction. Digital transformation prompts the IT infrastructure upgrade; AI brings new instructional possibilities; platforms dictate how those tools are governed; datafication raises moral questions; and post-pandemic pedagogy forces institutions to rethink how teaching actually works. For China HEIs, the tensions are acute: grand national blueprints collide with uneven capacity and funding; AI's promise outpaces faculty and student readiness; private platforms challenge institutional capacity; datafication amplifies privacy risks; and innovation risks fading once emergency subsidies end.

Such contradictions underscore the necessity of deepening institutional understanding of e-learning policy—not as a technical guideline, but as a strategic framework for aligning IT infrastructure, pedagogical practice, and data-governance. Without a coherent institutional policy comprehension, the momentum generated by digital transformation and AI risks being dissipated by fragmented implementation and

policy-practice disjunction.

To integrate e-learning into teaching and learning in higher education is an inevitable trend, but administrators and decision-makers at universities conceptualize the role of e-learning technologies in various forms, which particularly manifest in their e-learning policies. The next section will discuss the literature about how e-learning policy informing the role of e-learning technologies in universities and the critique regarding technocracy and instrumentalism.

### **2.3 Literature regarding the role of e-learning technologies in HEIs**

Since e-learning technologies is constantly evolving, how to address the complexity of e-learning in teaching and learning caused a heated debate. The majority of scholars critically evaluate the role of e-learning technologies in higher education, considering about human agency, neutrality, and determinism both technologically and socially. Feenberg's exploration (1999) of technology's relationship with society offers a nuanced understanding through the lens of four distinct perspectives: determinist, instrumental, substantivist, and critical (see Figure 2.1).

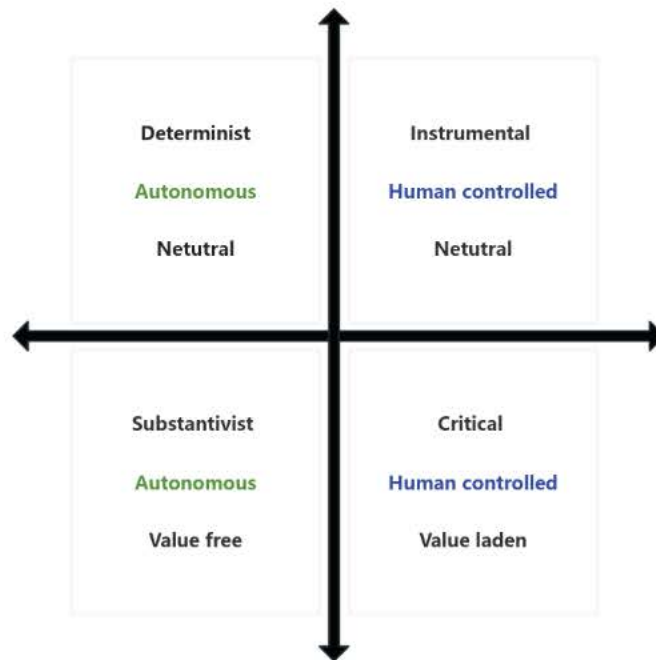


Figure 2.1 Four theoretical perspectives on the role of technology;

Source: Adopted from Feenberg (1999)

To begin with, the determinist view, for instance, maintains that technology evolves according to its own internal logic, progressing in ways that are largely beyond human influence, and shaping society in ways that seem inevitable. Technology, in this sense, becomes an uncontrollable force, with outcomes that cannot be altered by human agency. Feenberg, however, pushes back against this fatalistic perspective, favoring a more human-centered view found in the instrumentalist model. The instrumentalist position treats technology as a neutral tool, shaped entirely by human intent and value systems. Yet, Feenberg acknowledges a limitation: while human agency is central, the model oversimplifies the interaction between technology and society. Technology is not merely a passive instrument but evolves within and responds to complex social forces, often in ways that challenge the very intentions behind its design. This nuance is highlighted by scholars such as Mitcham (1994), who argue that technology must be viewed within a broader context, as something that operates within and influences

social dynamics.

Then, Feenberg also takes issue with the substantivist position, which argues that technology develops autonomously, gaining power over human values and actions. Drawing from thinkers like Ellul (1964) and Marcuse (1964), substantivism sees technological development as a force that inevitably reshapes society in its image, subverting human autonomy. Feenberg critiques this view, suggesting that while technology's trajectory may be influenced by internal logics, this process is not fixed. Far from being an inevitable force, technological progress is subject to human intervention. The critical perspective, Feenberg adopts, stands as a rejection of the notion that technology must either be controlled by or succumb to external forces. Instead, it asserts that technology is socially constructed and embedded with power relations, and that these systems can be contested and transformed through democratic action. In this light, technology becomes not a master but a field of struggle, where different social groups contest control over its design, use, and implications.

Ultimately, Feenberg's critical perspective provides a framework that sees technology as both a potential tool of domination and a means of human emancipation. It challenges the notion that technology is inherently neutral or deterministic, urging us to recognize it as a site of social contestation. In the specific case of e-learning in higher education, Feenberg's model offers a lens through which we can see how educational technologies—far from being unbiased instruments—often reflect and

reinforce the power dynamics within academic institutions. Scholars such as Selwyn (2016) have pointed out that rather than bridging gaps, e-learning technologies often amplify existing inequalities. Feenberg's critical perspective calls for a more thoughtful engagement with these technologies, urging for democratic participation in their design and implementation. This means that not merely accepting technological innovations as they come but actively shaping them to foster more equitable and empowering educational environments, where both students and educators can influence the systems that govern their learning.

### **2.3.1 Technological determinism**

Technological determinism, as a perspective on the role of technology in education (See Figure 2.2), assumes that technology is an autonomous force that drives predictable and inevitable change. This viewpoint tends to regard technology as neutral, beyond human control, and independent of social influences. Technological determinism is widely supported by scholars who argue that technology exerts a powerful, transformative influence on society, including in educational contexts. Marshall McLuhan (1964) is a leading proponent of this view, claiming that the medium itself, particularly electronic media, reshapes human consciousness and societal structures, thereby revolutionizing education. Similarly, Postman (1992) acknowledges the transformative power of technology, though with a critical eye, highlighting its profound effects on culture and education. Langdon Winner (1980) extends this perspective by emphasizing that technologies inherently influence power

structures and educational practices. Feenberg (1995) also supports technological determinism, recognizing that technological advancements in education drive change, although he adds that social values and human choices influence their design. These scholars agree that technology is a primary agent of educational transformation, often overshadowing the role of human agency in shaping educational outcomes.

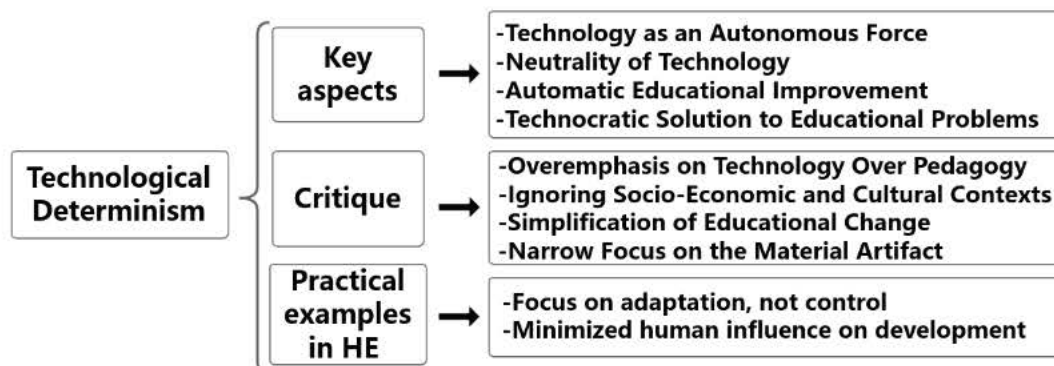


Figure 2.2 Technological Determinism

Source: Adapted from Feenberg (1995) & Selwyn (2010)

Critics argue that technological determinism oversimplifies the relationship between technology and society by neglecting the role of human agency and socio-cultural contexts. Feenberg (1999) argues that technological determinism fails to recognize the social construction of technology, where human choices, values, and interests shape technological development. Similarly, Selwyn (2010) contends that the deterministic approach overlooks the complexities involved in integrating technology into education, emphasizing that technology alone does not guarantee better learning outcomes. Mackenzie and Wajcman (1999) also criticize technological determinism for disregarding the social, political, and economic forces that guide technological progress. These critiques highlight that technological innovations are not neutral forces but are shaped by societal influences, and they stress the active role of humans in guiding technological development.

A notable example of technological determinism in higher education is the widespread adoption of LMS platforms like Moodle and Blackboard. While these systems were introduced with the expectation that they would improve teaching and learning outcomes, research by Selwyn (2010) shows that their impact is not as straightforward as technological determinism would suggest. The success of LMS depends on how faculty engage with the tools, the quality of training provided, and how well the systems align with pedagogical goals. Selwyn's research highlights that the introduction of LMS is often driven by institutional pressures to modernize rather than a careful consideration of how these systems can truly enhance learning. This example underscores the limitations of technological determinism, illustrating that technology alone does not guarantee improved educational outcomes—human agency and institutional support play critical roles in determining the success of these tools.

### **2.3.2 Instrumentalism**

The Instrumentalism (See Figure 2.3) posits that technologies are neutral tools whose success or failure depends on how they are implemented. Scholars such as Langdon Winner (1980) argue that technology does not inherently carry political or social meanings, but acquires these through human design and use. Similarly, Feenberg (1995, 1999) suggests that technology itself is neutral, with its effects determined by the choices of its users. Selwyn (2010) further supports this view, asserting that while technology extends human faculties, its impact remains neutral. According to

instrumental theorists, the focus should be on how society decides to apply technology, rather than on the technology itself.

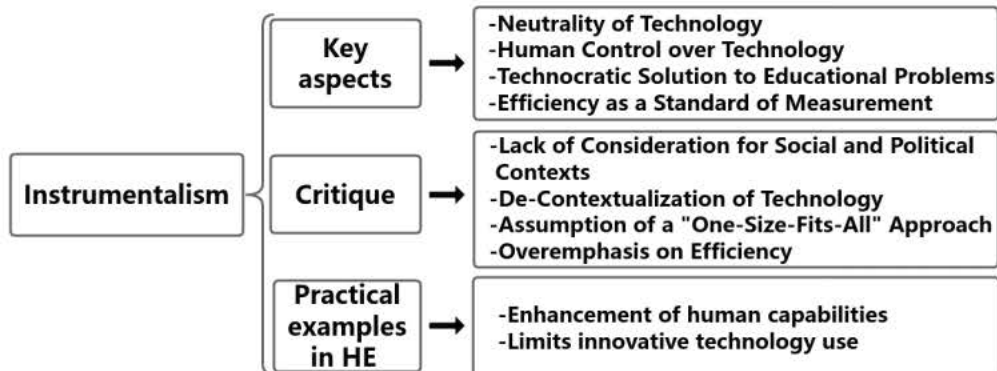


Figure 2.3 Instrumentalism

Source: Adapted from Feenberg (1995; 1998) & Selwyn (2010)

Critics of Instrumentalism argue that it oversimplifies the relationship between technology and society by ignoring the broader socio-political factors that shape technological outcomes. Winner (1980) challenges the theory, pointing out that technologies are rarely neutral, as they often reflect the values and interests of the groups that create them. Selwyn (2010) also contends that the belief in technology's neutrality fails to consider the embedded power dynamics and social influences that are inherent in the design and use of technology. These critiques suggest that the Instrumentalism overlooks how technology can perpetuate inequalities and power structures.

In higher education context, instrumentalism treats e-learning as a neutral tool designed to extend human capabilities, but this perspective overlooks how technology can influence behavior and actions in both bright and dark sides. Jonassen (1996) contends that technologies should support learners in building knowledge, not control

the learning process. However, the assumption that e-learning is a "technological fix" for educational challenges, as Feenberg (1999) viewed, discounts the potential of technology by reducing it to a problem-solving tool. This narrow view restricts innovative uses of technology, preventing educators from exploring its full transformative potential and hindering the flexibility needed to address diverse educational needs.

### 2.3.3 Substantive Theory

Substantive Theory (See Figure 2.4), in contrast to the Instrumentalism, presents a view where technology is not merely a tool that serves human purposes, but rather, a force that actively reshapes and transforms society and human existence. Heidegger (1977) have argued that technology has become a central force in modern culture, reconfiguring human life to such an extent that it is no longer under our full control. Substantive Theory displayed as the power of technology to change us, our societies, and the way we interact with the world, leaving little room for human agency.

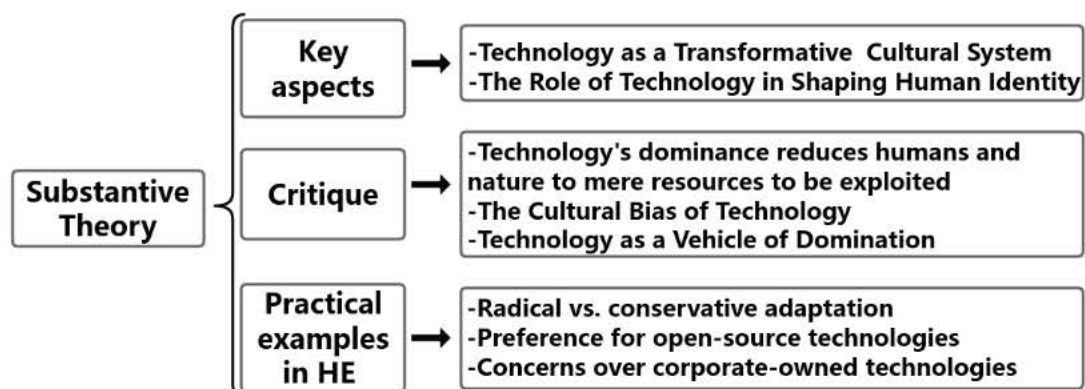
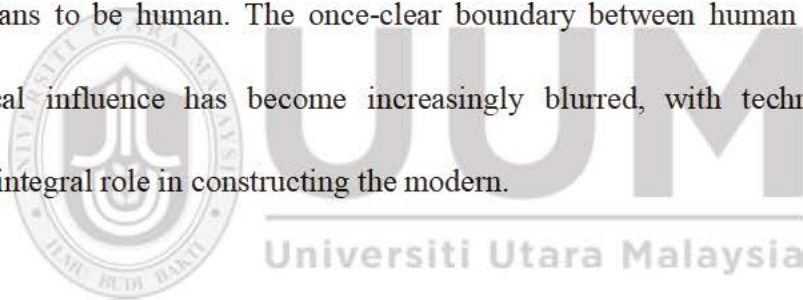


Figure 2.4 Substantive Theory  
Source: Adapted from Feenberg (1995; 1998) & Heidegger (1977)

One of the key aspects of Substantive Theory is its emphasis on technology's role in shaping human identity. It suggests that technology does not just alter how we perform tasks; it transforms who we are as individuals. Heidegger (1977), a central figure in this theory, argues that we have become "raw materials" mobilized by technology, with our very existence increasingly defined by the technological systems that govern us. In this sense, technology has become so deeply intertwined with human life that our identities and behaviours are often shaped by it in ways that are not immediately apparent. The implications of this shift are significant: technology shapes our interactions, our perceptions of the world, and even our understanding of what it means to be human. The once-clear boundary between human agency and technological influence has become increasingly blurred, with technology now playing an integral role in constructing the modern.



Substantive Theory also critiques technology's role in reducing human beings and nature to mere resources. Heidegger's notion of the "nihilistic will to power" suggests that technological dominance is inherently dehumanizing, as it transforms everything—including human life—into something to be exploited for utility and efficiency (Heidegger, 1977). This process reflects a broader cultural trend where technological progress prioritizes efficiency over human values, reducing both individuals and the natural world to objects for manipulation and control. In this view, technology becomes a force that imposes a system of values that may not align with human needs or aspirations. This critique is further supported by the argument that

technology carries with it a cultural bias—embedded assumptions about what is efficient or valuable, which influences how we use technology and even how we think about the world around us. Technology does not just reflect pre-existing cultural values; it actively shapes them, subtly steering our priorities and behaviours in ways that reinforce certain ideologies, often without our awareness.

Finally, Substantive Theory posits that technology is not merely a neutral tool but a vehicle for domination. The adoption and use of technology come with implicit cultural and ideological forces that can either reinforce or challenge existing power structures. In this sense, technology is both a product of and a contributor to systems of control and domination. While technology can provide significant benefits, it can also perpetuate inequalities, exacerbate social divisions, and serve the interests of dominant groups. This duality is particularly evident in the context of e-learning, where the adoption of technological systems in education often reflects and reinforces existing power dynamics within institutions. Scholars like Feenberg (1999) have argued that technology's potential for domination is not inherent but arises from the ways it is designed and used. The critical challenge, then, is not the technology itself but how it is integrated into societal structures, shaping human behaviour and reinforcing ideologies of control.

In the context of higher education, Substantive Theory suggests that the pervasive role of technology requires radical changes to the structure of educational institutions. As

technology continues to reshape society, universities must adapt or risk becoming obsolete. This could mean adopting more flexible learning models that embrace distance learning, collaborative tools, and open-source platforms—or it could involve deeper institutional transformations that radically rethink the way education is structured.

#### **2.3.4 Critical Theory**

Critical theory challenges the idea that technology is a neutral tool, free from biases and independent of the social and political contexts in which it is created and used. One of its key critiques is the rejection of technological neutrality, particularly in educational technologies like LMS platforms such as Blackboard or WebCT. These platforms are often marketed as impartial tools that improve teaching and learning. However, from a critical perspective, these technologies are not simply neutral; they are shaped by the interests and values of the corporations that develop them. As Feenberg (1991) argues, technologies often embed "technological rationality"—a set of values that align more closely with corporate or institutional interests than with the educational needs of users. These platforms, for example, collect data, monitor users, and may even influence teaching practices in ways that serve corporate agendas, rather than purely educational goals.

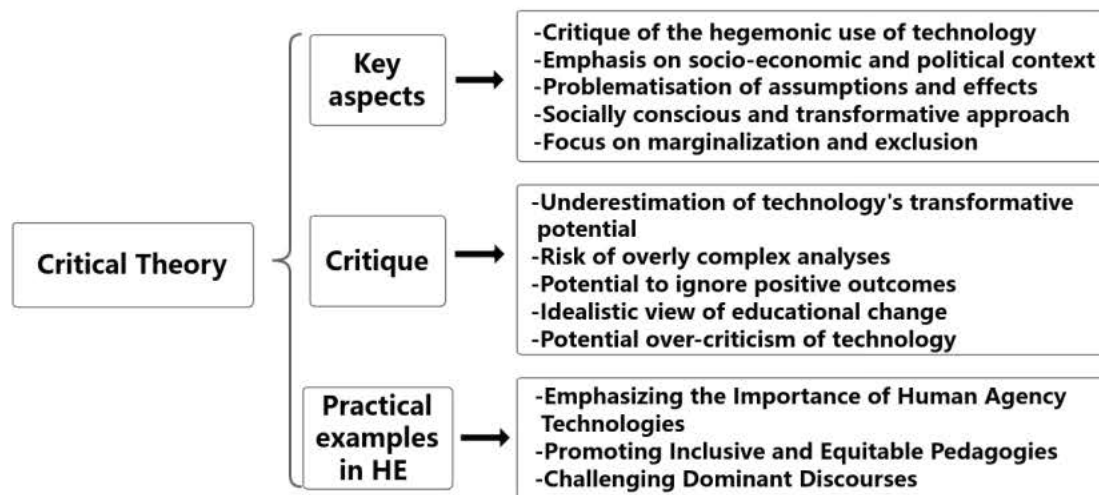


Figure 2.5 Critical Theory

Source: Adapted from Feenberg (1991) & Selwyn (2016)

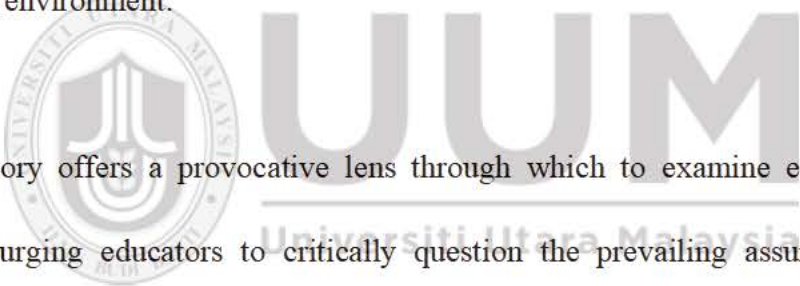
Critical theorists also emphasize the role of socio-economic and political contexts in shaping the development and use of technology. Selwyn (2016) argues that technology is not simply a technical solution to educational challenges but is deeply influenced by the broader socio-political environment. The adoption of e-learning technologies, for instance, can be driven by market pressures, funding models, and governmental policies, which may prioritize cost-cutting or efficiency over improving educational quality. In a market-driven educational landscape, technologies might be implemented with the aim of reducing costs rather than enhancing learning outcomes. This reflects a broader political agenda where educational technologies become instruments of neoliberal policies that prioritize productivity and profitability over social equity and access to quality education.

Feenberg (1991) further contends that technology should be understood as a site of struggle and conflict, not as a deterministic force. The scholar describes technology as "an ambivalent process of development suspended between different possibilities,"

suggesting that it is not preordained to follow a singular path. Technologies, particularly in education, can be interpreted and used in various ways, leading to different outcomes. Critical theorists would therefore question whose interests are served by a particular technology. For example, with the implementation of an LMS, one might ask: Who benefits from its use? Does it empower educators and students, or does it serve corporate interests and governmental goals? By examining these power dynamics, critical theory calls attention to the potential for marginalization, exclusion, and the reinforcement of existing inequalities in educational settings.

In addition to questioning the technologies themselves, critical theory also urges a critical examination of the political processes behind e-learning policies (McLuhan & Fiore, 1967). The formulation of these policies often reflects decisions about how educational systems should be structured and which technologies should be prioritized. Critical theorists ask who is involved in shaping these policies and whether they are designed with the needs of marginalized groups in mind. For example, do these policies adequately address the needs of students from lower socio-economic backgrounds or those with disabilities? Or do they primarily serve the interests of the tech industry and its stakeholders? By examining the politics of e-learning policy, critical theory challenges the assumption that technological interventions in education are always beneficial or neutral.

Finally, critical theory emphasizes the role of educators and other stakeholders in shaping the educational landscape. Rather than accepting technology as an immutable force, critical theorists argue that educators, students, administrators, and policymakers should play an active role in the decision-making processes surrounding technology use (Brookfield, 2005). They should question how technologies are introduced, whose interests they serve, and whether they truly benefit all students. In this sense, critical theory empowers these actors to engage in the ongoing negotiation of technology's role in education, ensuring that technology is not imposed upon them, but rather is shaped by their collective input to reflect a more equitable, democratic educational environment.



Critical theory offers a provocative lens through which to examine e-learning in education, urging educators to critically question the prevailing assumption that technology inherently enhances learning. It challenges the idea that technological adoption is neutral, instead emphasizing how it often reflects underlying cultural, political, and economic ideologies. Educators who embrace this viewpoint are encouraged to interrogate the motivations behind technology's implementation, recognizing that the tools used in education may carry embedded values that shape the learning environment in ways that reinforce existing power structures.

At the same time, critical theory advocates for pedagogical practices that prioritize inclusivity and equity, pushing educators to design learning experiences sensitive to

the diverse needs of their students. This approach could lead, for instance, to the adoption of open educational resources (OER) in place of costly proprietary materials, promoting broader access to education. By challenging the commodification of knowledge, critical theory seeks to dismantle financial barriers that disproportionately affect marginalized communities, ensuring that education is more accessible and less influenced by economic privilege.

Moreover, critical theory resists the deterministic view of technology, which suggests that technological progress is a fixed force that shapes society in one direction. Instead, it emphasizes human agency, urging educators, students, and policymakers to actively engage in shaping how technology is integrated into educational settings. This perspective invites ongoing dialogue about the social consequences of technological use, fostering an environment where collective action can lead to meaningful change and ensuring that educational technology serves the interests of all students, rather than reinforcing existing hierarchies.

Following paragraphs will extend two debates for further understanding of the role of e-learning technologies. They are Technological Determinism vs. Sociomaterial Contingency, and Training Quantity vs. Pedagogical Transfer (Capacity Building).

The debate between technological determinism and sociomaterial contingency frames how digital transformation in education is understood and enacted. Technological

determinism assumes that e-learning tools inherently modernise pedagogy, democratise access, and improve learning outcomes once implemented (Selwyn, 2011; Zawacki-Richter et al., 2020). This perspective treats technology as a neutral, progressive force capable of driving educational reform autonomously. However, critics contend that such views overlook the social, cultural, and institutional conditions that mediate technological use. Feenberg (1991) argues that technology is an “ambivalent process” shaped by competing possibilities, while Selwyn (2014) and Williamson (2017) emphasise that educational technologies often reproduce existing hierarchies and serve institutional or commercial interests. From a sociomaterial standpoint, pedagogy arises from the dynamic interplay of teachers, students, tools, and organisational cultures rather than technology alone. Fawns’ (2022) “entangled pedagogy” model captures this interdependence, highlighting that educational impact depends on how technologies are enacted within specific contexts. Thus, while determinism simplifies change as tool-driven, the sociomaterial view reasserts human agency and institutional context as central to meaningful digital transformation.

The recent study reveals a persistent tension between training quantity and pedagogical transfer in digital-pedagogy initiatives. Large-scale professional development programs often prioritise volume—measured by hours, certifications, or platform adoption—on the assumption that more exposure produces higher digital competence (Bo, 2025). Evidence suggests that greater participation can indeed raise self-reported skills, yet this “dose effect” rarely translates into sustained pedagogical

change. Research informed by TPACK and SAMR frameworks shows that true capability building requires teachers to integrate content, pedagogy, and technology in contextually meaningful ways (Almeida et al., 2022). However, such transfer is often constrained by time, institutional culture, and limited incentives (Dias-Trindade, et al., 2023). Linear models like SAMR neglect sociocultural and structural factors that shape classroom realities. While scaling training broadens reach, pedagogical transformation depends on quality, contextual support, and reflective practice (Falloon, 2020). Effective capability building thus demands not merely “more training” but institutional ecosystems that enable teachers to adapt, experiment, and internalise digital pedagogy.

### **2.3.5 Sociotechnical and Affordance Perspectives**

The persistent puzzle in adopting e-learning is not why some educational technologies work, but why the same technologies yield vastly different results across universities. One university’s LMS becomes a catalyst for collaborative pedagogy; another’s remains an inert administrative tool. To explain this uneven impact, Sociotechnical Systems (STS), Affordance Theory, and Actor-Network Theory (ANT) offer complementary perspectives that move beyond deterministic or instrumental views of technology. These theories help explain how they sharpen the debate on technological determinism and instrumentalism, and link human factors to pedagogy.

*Debate on the limits of Technological Determinism and Instrumentalism*

Affordance theory has long provided a compelling framework for analyzing the relationship between users and technology, particularly in educational contexts. Originating from Gibson's (1979) ecological psychology and later refined by Norman (1999) and Leonardi (2011), the theory emphasizes the perceived and actual possibilities for action that technologies offer to users. Its strength lies in bridging the gap between design intention and user practice by highlighting the relational nature of affordances. In higher education, this perspective explains why identical digital platforms can generate divergent pedagogical outcomes across institutions: what one lecturer perceives as a space for collaboration, another may experience as a repository for static content. These differences reveal that affordances are not inherent features of technology but are co-constructed through users' perceptions, competencies, and institutional incentives. In the Chinese higher education context, where hierarchical governance structures often influence faculty autonomy, affordance theory provides a useful lens to analyse how authority and institutional culture mediate the perceived usability of e-learning systems. By focusing on user–technology interaction, the framework offers a grounded, context-sensitive approach to understanding how e-learning technologies shape teaching and learning.

However, despite its explanatory power, affordance theory encounters significant limitations when addressing macro-level structures, power relations, and the political economy of digital transformation. From the perspective of STS theory, technological

change cannot be understood solely through user interaction because it is embedded within an interdependent system of people, processes, and artefacts (Trist & Bamforth, 1951; Sawyer & Jarrahi, 2023). STS emphasizes that organizational outcomes depend on the joint optimization of social and technical subsystems. In the case of e-learning policy and practice, this means that successful implementation hinges not only on user engagement but also on how institutions align leadership, governance, and culture with technological design. Analysing technology purely through affordances risks overlooking how institutional structures enable or constrain what affordances are even possible. In Chinese higher education, this critique is particularly salient, as universities' capacity to actualize technological potential often depends on the alignment between state-level digital strategies and institutional readiness.

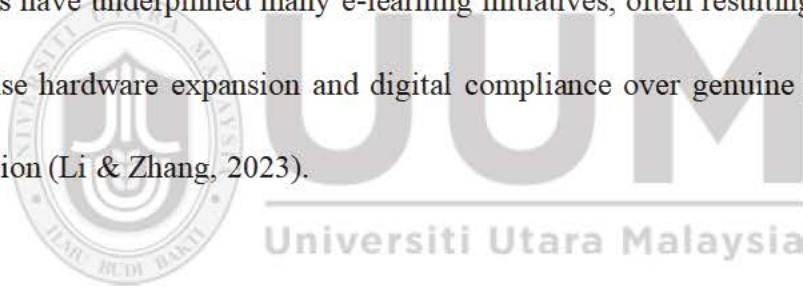
ANT extends this critique further by challenging the human-centred assumptions embedded in both affordance and sociotechnical approaches. Developed by Latour (2005) and Callon, ANT conceptualize social order as the product of networks composed of both human and non-human actors—teachers, students, algorithms, dashboards, and policies—that interact and co-constitute each other. From this perspective, technologies are not passive instruments but active mediators that shape relations and redistribute control. Applied to e-learning, ANT suggests that platforms and algorithms do not merely afford certain behaviors but actively enact new forms of governance by altering visibility, accountability, and decision-making processes. This lens exposes the micro-politics of technological determinism—the subtle ways in

which power and agency are inscribed in code, standards, and infrastructures. In doing so, it helps explain why even well-intentioned e-learning reforms may produce unforeseen hierarchies or dependencies once translated into e-learning architectures.

These perspectives demonstrate the need to move beyond a merely affordance-based understanding of educational technologies toward a more integrated sociotechnical view. Affordance theory illuminates the micro-level of user perception and interaction (How do faculty and students perceive and act upon technological possibilities); STS provides insight into the meso-level of institutional alignment and systemic design (How do institutional practices and leadership shape those affordances); and ANT uncovers the macro-level politics of technological governance (How do policy networks, infrastructures, and non-human actors co-produce digital governance). By synthesising these perspectives, researchers can better capture the relational, contextual, and power-laden nature of e-learning implementation. Such integration shifts the analysis from linear causality—where tools are assumed to cause pedagogical change—to a model of networked co-construction, in which technologies, institutions, and policies continuously shape one another. This multi-layered perspective is particularly useful for examining the interplay between China's Informatization 2.0 and institutional e-learning policies, where the interplay between state ambitions, institutional practices, and IT infrastructures determines the uneven pedagogical outcomes observed across the higher education sector.

### *Linking human factors to Pedagogy*

Much of the early discourse on educational technologies was driven by an implicit technological determinism—the belief that technology itself propels educational progress (Veletsianos & Moe, 2017). This view assumes a linear causality: that the adoption of digital tools will automatically modernise pedagogy, democratise access, and enhance quality. Similarly, instrumentalist perspectives that treat technology as a neutral means to predetermined educational ends have been critiqued for overlooking the complex pedagogical, cognitive, and institutional processes that mediate technological use (Jandrić & Knox, 2021). In China’s higher education context, such assumptions have underpinned many e-learning initiatives, often resulting in systems that prioritise hardware expansion and digital compliance over genuine pedagogical transformation (Li & Zhang, 2023).



Proponents of digital pedagogy frameworks argue that overcoming these limitations requires re-embedding the human factor at the centre of technology integration (Mishra & Koehler, 2006). The Technological Pedagogical Content Knowledge (TPACK) model offers a conceptual bridge between technology and teaching by locating effective digital practice at the intersection of content expertise, pedagogical strategy, and technological proficiency (Mishra & Koehler, 2006; Koehler & Mishra, 2009). Unlike deterministic paradigms, TPACK treats technology not as an autonomous driver but as one dimension of a dynamic triad of professional knowledge (Mishra & Koehler, 2006). Its central insight is that digital competence

cannot be reduced to technical skill acquisition; rather, it entails a holistic understanding of how technology reshapes disciplinary meaning and learning processes (Koehler & Mishra, 2009). Within the Chinese e-learning reform agenda, TPACK offers a framework for rethinking teacher development programs: moving beyond button-press training to cultivate reflective practitioners capable of designing technology-enhanced learning environments that align with curricular goals and cultural contexts (Sun, et al., 2024).

Complementing TPACK, the Substitution–Augmentation–Modification–Redefinition (SAMR) model (Puentedura, 2012) provides a developmental pathway for pedagogical transformation. The model distinguishes between superficial and substantive uses of technology: substitution and augmentation involve enhancement of existing practices, while modification and redefinition enable transformative redesign of learning tasks (Romrell, Kidder, & Wood, 2014; Puentedura, 2012). This continuum underscores that the pedagogical value of digital innovation depends on its depth of integration rather than its mere presence (Puentedura, 2012). For example, digitising lectures achieves only minimal enhancement, whereas reconfiguring learning around collaboration, creativity, and authentic problem-solving exemplifies higher-order transformation (eSchool News, 2015; Romrell et al., 2014). In Chinese higher education, where digital reforms often emphasise quantitative metrics—such as training hours or platform adoption rates—SAMR reintroduces a qualitative dimension, focusing on how and why technologies are embedded in teaching

(Pressbooks, 2019).

Yet, despite their analytical and practical strengths, these frameworks are not without critique. Critics argue that while frameworks such as TPACK and SAMR successfully restore the teacher to the centre of online and hybrid learning, they risk underplaying structural and institutional constraints that shape technological enactment (Henderson et al., 2023; Kimmons & Hall, 2016). From a sociotechnical standpoint, pedagogical transformation cannot occur in isolation from organisational culture, policy incentives, and governance systems; rather, faculty autonomy, time allocation, and institutional reward structures remain decisive in determining whether digital pedagogy can flourish (Henderson et al., 2023). In many Chinese HEIs, faculty operate within rigid bureaucratic frameworks prioritising research outputs or administrative compliance, leaving little room for pedagogical experimentation (Changming, 2024). Consequently, even the most sophisticated digital-pedagogy models may remain aspirational unless embedded within supportive institutional ecosystems that recognise teaching innovation as a valued form of academic labour (Kimmons & Hall, 2016; Changming, 2024).

A further critique emerges from the political dimension of educational technology: platforms, algorithms and analytics do not simply support learning—they mediate visibility, control and accountability (Nichols & Dixon-Román, 2024). Actor-Network and critical sociotechnical scholars remind us that teachers' autonomy can be

constrained by the very technologies designed to empower them (Angeli & Ekman, 2022). Thus, to move fully “beyond determinism and instrumentalism,” digital pedagogy frameworks must be situated within an understanding of governance, power and institutional agency (Nichols & Dixon-Román, 2024; Angeli & Ekman, 2022).

Despite these challenges, TPACK and SAMR provide crucial scaffolding for re-embedding human agency in educational technology discourse (Alivi, 2019; Voogt & McKenney, 2020). They shift the narrative from technology adoption to pedagogical orchestration, from the quantity of digital resources to the quality of their pedagogical design (Alivi, 2019). When integrated with broader sociotechnical perspectives, these frameworks enable a multi-layered understanding of digital transformation: one that recognises both the human creativity at the heart of teaching and the systemic conditions required to sustain it (Voogt & McKenney, 2020). For policymakers and institutional leaders in China’s higher education sector, this implies that meaningful digital reform lies not in proliferating platforms but in cultivating digitally literate educators capable of designing, adapting, and reflecting upon technology’s pedagogical potential (Alivi, 2019; Voogt & McKenney, 2020). In this sense, the re-embedding of the human factor is not a return to pre-digital pedagogy, but an advancement toward a more reflexive, context-aware, and ethically grounded form of digital education (Voogt & McKenney, 2020).

## 2.4 E-learning implementation in China HEIs

### 2.4.1 Overview of e-learning implementation in China HEIs

The integration of e-learning, a disruptive innovation, into tertiary education in China has resulted in a notable increase in the incorporation of e-learning technologies as an essential facet of educational programs by an expanding array of Chinese universities. This inclination is driven by the improved accessibility and broadened learning opportunities brought by ever-updating internet technologies. To better understand the overall picture of e-learning implementation in China HEIs, this section will emphasize on analyzing online infrastructure and technology (the internet infrastructure, e-learning systems, and digital educational resources), institutional readiness (faculty training, institutional commitment, and technical support), and pedagogical approaches deployed by Chinese universities (See table 2.4)

Table 2.4 Overall Picture of e-learning implementation at China HEIs

Categories	Internet Infrastructure	E-learning systems	National Digital educational resources	
All HEIs	1.04 Mbps Per Capita Wi-Fi access points per 100:20 Data center:263 m <sup>2</sup> Physical Servers:77 Virtual Servers:179	98.1% of all HEIs implemented Learning management systems(LMS) and 93.7% of them implemented student administration platforms	All HEIs can freely access and upload online resources to China Smart Higher Education Platform (launched and funded by MOE)	
Categories	Faculty training	Institutional commitment	Technical Support	Pedagogical use of Tech
All HEIs	91.6% (1098 universities), provide training sessions to enhance teachers' digital competency and pedagogical skills. Additionally, 48.6% (583 universities) have established benchmarks to assess teachers' digital literacy and pedagogical skills, while 52.3% (627 universities) carry out measurements to evaluate	exceeding 97% of universities, appoint a specific chancellor to oversee the Department of Internet Security and ICT in Education. 85.2% (1061 universities) conduct regular meetings.75.8% (944 universities) engage in regular leadership group meetings. 90% (1121 universities) hold meetings for the annual plan	86.3% (1079 universities) offer IT technical support, 77.9% (974 universities) provide IT consulting services, and 54.6% (683 universities) extend desktop technical support.	personalized learning 34.3% blended learning 31.6% synchronous learning 13.2% Asynchronous learning 34.3% distance learning 9.7% virtual reality learning 2.8%

(Source: The Information Technology Center of MOE, 2023)

According to a nationwide survey on the development of internet facilities in Chinese universities (The Information Technology Center of MOE, 2023), approximately 98% of the universities have implemented comprehensive, campus-wide coverage of free

Wi-Fi services. Regarding the per capita network broadband for online teaching and learning, Double-First-Class universities provide an average of 1.03 Mbps for students and teachers. While academic HEIs offer 1.08 Mbps, vocational HEIs provide 1.03 Mbps, which indicate that vocational skill-oriented universities fall short of the overall university average of 0.01 Mbps.

For Wi-Fi access points per 100 students, Double-First-Class universities have an average of 37.4 access points, while academic HEIs provide an average of 19.3 access points; Vocational HEIs offer an average of 18.7 access points. As for value-added services, the survey revealed that 74% of the sampled universities provide VPN services. CARSI (China Education and Research Computer Network Federation Authentication and Resource Sharing Infrastructure) services are offered by 24% of the sampled universities, while EduRoam (Global Cross-Domain Wireless Roaming Authentication Service) services are provided by 18% of them. Notably, among the surveyed universities, two Double First-Class universities, 69 academic HEIs, and 118 vocational HEIs do not offer any of the VPN, CARSI, or EduRoam services. 253 out of the 1,159 universities included in the survey did not offer any of the VPN, CARSI, or EduRoam services. It is worth noting that Double First-Class universities expressed a greater need for CARSI and EduRoam services, while VPN services were identified as common and sophisticated value-added services across all categories of universities.

Regarding hardware and software infrastructure, data processing centers of Double First-Class universities surpass both academic HEIs and vocational HEIs. On average, Double First-Class universities have 333 physical computer servers, significantly higher than the 68 physical computer servers found in academic HEIs and the 66 physical computer servers in vocational HEIs. Similarly, Double First-Class universities also lead in over virtual computer servers, with an average of 632 servers, while academic HEIs have 177 virtual computer servers and vocational HEIs have 115 virtual computer servers. This figure indicates that Double First-Class universities tend to have more robust and extensive computing resources in their data processing centers compared to the other two types of universities (The Information Technology Center of MOE, 2023).

Regarding e-learning systems in Chinese universities, a significant majority of institutions have made notable progress. In 2023, an impressive 98.1% of the surveyed 1,192 Chinese universities had implemented learning management systems, demonstrating a strong commitment to e-learning. Additionally, 93.7% of the 1,138 universities included in the survey had established student administration systems, indicating a comprehensive approach to managing student-related tasks.

Notably, all Double First-Class universities, ranked within the top 140, have successfully established robust e-learning systems across a diverse range of fields.

These systems encompass various components, such as learning management systems,

Massive Open Online Courses (MOOCs), mobile learning applications, and social learning platforms. This comprehensive integration of e-learning technologies highlights the emphasis placed on providing advanced and versatile educational experiences in these institutions.

Intending to better facilitate the integration of internet-based technologies in teaching and learning, expand access to premium education resources and promote overall quality of education programs in China HEIs, China Ministry of Education (MOE, 2015) initially launched a program, encouraging higher education institutions to build well-developed open online courses and facilitate the deployment of e-learning tools. Chinese higher education institutions (HEIs) have uploaded their premium online courses and digital content to the China Smart Higher Education Platform, funded by the Ministry of Education (MOE).

Until 2023, the China Smart Higher Education Platform supported by MOE has achieved significant success by offering a comprehensive collection of digital educational resources. With 27,000 high-quality MOOCs and over 65,000 additional resources, such as textbooks and experimental logs, the platform covers a wide range of disciplines in higher education. In addition to delivering quality teaching and learning experiences, the platform has expanded its focus to include fostering creativity and innovation among students through the integration of innovative entrepreneurial resources. This initiative aims to empower students to embrace

audacity and entrepreneurship. Impressively, the platform has recorded a total of 29.2 billion visits and 500 million enrollments, indicating its substantial impact on implementing e-learning (Editorial Department, 2023).

Faculty training plays a crucial role in ensuring institutional readiness for the implementation of e-learning. The survey results indicate that a significant majority of sampled universities, specifically 91.6% (1098 universities), provide training sessions to enhance teachers' digital competency and pedagogical skills. Additionally, 48.6% (583 universities) have established benchmarks to assess teachers' digital literacy and pedagogical skills, while 52.3% (627 universities) carry out measurements to evaluate these skills (The Information Technology Center of MOE, 2023).

Interestingly, 4.3% (51 universities) of the sampled institutions do not implement any training sessions, benchmarks, or measurements. Among three categories of universities, Vocational HEIs prioritize training sessions the most with 95.75% placing a heavy emphasis on enhancing teachers' digital competency and pedagogical skills. Double First-Class universities follow closely with 92.2%, while academic HEIs have the lowest percentage, at 89.1%, in terms of conducting training classes for teachers' professional development in digital literacy and pedagogical skills (The Information Technology Center of MOE, 2023).

Leadership is one of critical success factors determining e-learning implementation at

universities(Chipere, 2017; Sidhu & Gage, 2021). Institutional commitment is a indicator of evaluating effective leadership in e-learning implementation (Chipere, 2017). One study examined the influence of leadership on the integration of e-learning, utilizing institutional plans and committee involvement as metrics. The study revealed a positive correlation between higher committee involvement, awareness of institutional plans, and the adoption of e-learning practices (Sidhu & Gage, 2021).

The nationwide survey conducted in China (The Information Technology Center of MOE, 2023) revealed that a substantial majority, exceeding 97% of universities, appoint a specific chancellor to oversee the Department of Internet Security and ICT in Education. This finding suggests a strong tendency towards greater committee involvement. Among the surveyed universities, 34.5% (434 universities) appoint a chancellor as the director of the Internet Security and ICT in Education department, while 62.5% (789 universities) designate a vice chancellor for this role. A small minority, about 2.9% (36 universities), choose non-chancellor individuals as directors. In contrast, only 0.2% (2 universities) reported having no director for this position in 2021, and by 2023, all universities had filled this role (The Information Technology Center of MOE, 2021; 2023).

In terms of the awareness of institutional plans among teaching staff, the survey examined four indicators: regular meetings for special work on internet security and

ICT in education, regular leadership group meetings for decision-making on internet security and ICT in education, meetings for the annual plan of internet security and ICT in education, and other meetings centered on internet security and ICT in education. Among the surveyed universities, 85.2% (1,061 universities) conduct regular meetings for special work on internet security and ICT in education, while 75.8% (944 universities) engage in regular leadership group meetings for decision-making on internet security and ICT in education. Additionally, 90% (1,121 universities) hold meetings for the annual plan of internet security and ICT in education. Lastly, 10.4% (129 universities) conduct other meetings related to internet security and ICT in education (The Information Technology Center of MOE, 2023).

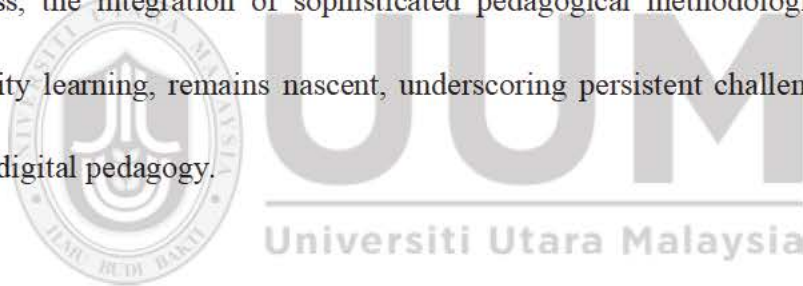
The nationwide survey conducted by The Information Technology Center of MOE (2023) yielded invaluable insights into technical support provision in Chinese universities. The results indicated that 95.4% of the sampled universities have established individual Department of Internet Security and ICT in Education, demonstrating their concentrated efforts in this domain. Moreover, 82.7% of the universities have independent branches specifically focused on Internet Security and ICT in Education, responsible for providing technical support and overseeing related tasks.

On average, each university employs 14.1 internet security engineers within the Department of Internet Security and ICT in Education. Notably, Double First-Class

Universities exhibit a substantially higher average of 38.3 technicians and internet engineers, while China academic HEIs employ an average of 14.9, and vocational HEIs employ an average of 9.3. These findings emphasize the disparities in technical support resources across different university types. Additionally, the survey revealed that 86.3% (1079 universities) offer IT technical support, 77.9% (974 universities) provide consulting services for IT services, and 54.6% (683 universities) extend desktop technical support. These findings demonstrate the range of technical support services available in Chinese universities.

When implementing e-learning in learning and teaching, Chinese universities commonly employ several pedagogical approaches, including blended learning, synchronous learning, asynchronous learning, collaborative learning, personalized learning, and virtual reality learning (Osadcha, et al., 2021). Notably, in 2023, an examination of a representative sample of Chinese HEIs revealed the incorporation of personalized learning into educational programs at an average rate of 34.3%. Similarly, blended learning was deployed by 31.6% of the sampled institutions, while synchronous learning was utilized by 13.2% of them. Asynchronous learning was employed by 34.3% of the institutions, and distance learning by 9.7%. A relatively small percentage of the sampled Chinese higher education institutions, merely 2.8%, incorporated virtual reality learning into their educational practices (The Information Technology Center of MOE, 2023).

In summary, e-learning has proliferated within Chinese HEIs, propelled by advancements in IT technologies and enhanced access to digital educational resources. A comprehensive survey disclosed that 98% of universities have achieved campus-wide Wi-Fi coverage, with Double First-Class universities excelling in technical infrastructure (The Information Technology Center of MOE, 2023). The vast majority of universities have instituted e-learning systems, with nearly universal adoption of learning management systems and student administration platforms. Faculty training and institutional leadership are pivotal, as most Chinese HEIs emphasize digital proficiency and appoint specialized chancellors for ICT governance. Nevertheless, the integration of sophisticated pedagogical methodologies, such as virtual reality learning, remains nascent, underscoring persistent challenges in fully embracing digital pedagogy.



#### **2.4.2 Driving factors to the growth of e-learning in China HEIs**

The rapid growth of e-learning in China represents a compelling case study to understand the driving factors behind the burgeoning industry. According to Holon IQ (2020), the Chinese e-learning market has grown at an average annual rate of 20%, and the user base has been expanding by roughly 22% per year. This growth can be attributed to driving force of technological, economic, and societal factors, synergized further by the COVID-19 pandemic.

Technologically, China has embraced various e-learning tools, including Learning

Management Systems, Massive Open Online Courses, Gamification, educational apps, and hybrid learning methods (Tyrkba et al., 2022). Such tools have not only widened the scope of e-learning but also enhanced its accessibility and effectiveness. Advances in high-speed internet, cloud computing, and mobile technologies have allowed these tools to be more readily available, breaking the barriers of time and location (Jacob & Issac, 2014). Furthermore, innovations like Artificial Intelligence and Virtual Reality enrich e-learning experiences by adding interactivity and personalization (Holmes & Gardner, 2019).

Economically, the growth in China's e-learning sector is substantially driven by venture capital investments, government spending, and foreign investments. China accounted for over half of the global venture capital investment in education in 2020, and the central government has also ramped up its educational expenditures, marking a cumulative growth of \$263.2 billion over a decade (HolonIQ, 2020). This strong financial backing has made e-learning a cost-effective option for educators and learners, circumventing the need for physical infrastructure (Bates, 2015).

Segment-wise, the market mainly focuses on primary and secondary education, exam preparation (such as IELTS, TOEFL, and National English Language Ability Test), and vocational education and training. Notably, e-learning targeted at primary and secondary education is the fastest-growing segment. In the meanwhile, the growth in vocational education and training aligns well with the global shift towards a

knowledge-based economy, making lifelong learning essential. Platforms facilitating this continual education offer an efficient way for individuals to upskill and reskill throughout their careers (Merriam & Bierema, 2013). Government policies and societal factors have also played a significant role. Grants and subsidies are often provided to encourage e-learning initiatives, particularly in developing countries (Trucano, 2005). In China, the government's support has been a cornerstone in fostering the e-learning environment.

However, it was the advent of the COVID-19 pandemic that served as a catalytic force, compelling educational institutions to switch to remote learning almost overnight (Daniel, 2020). Investments in educational technology surged globally, from \$18 billion before the outbreak to a projected \$350 billion by 2025. China, already on a growth trajectory, experienced a remarkable acceleration post-pandemic (Tyrkba et al., 2022). Lastly, e-learning in China demonstrates scalability, one of its key strengths. Unlike traditional educational setups constrained by physical infrastructure, e-learning platforms can effortlessly accommodate a growing number of users, making them highly scalable solutions (Kim & Bonk, 2006).

In summary, the robust growth of e-learning in China is a result of technological innovation, economic investment, societal changes, government support, and the unexpected acceleration brought on by the COVID-19 pandemic. These factors, coupled with the shift toward lifelong learning and the scalability of e-learning

platforms, form a synergistic ecosystem that propels the continuous expansion of the e-learning market in China and beyond.

### **2.4.3 Barriers to e-learning implementation in China academic HEIs**

The literature presents several challenges in implementing e-learning in China's academic Higher Education Institutions (HEIs), ranging from infrastructural constraints, quality assurance, pedagogical adjustments to faculty training and support, insufficient student engagement (Ding, et al., 2010, Fu, 2022; Huang, 2020; Li, et al., 2017; Li, et al., 2019; Ling & Ze, 2011; Liu, et al, 2019; Wang, et al., 2018; Wu & Li, 2020; Zhao & Song, 2021; Zhang, et al., 2012; Ting, et al, 2018; Tsegay, et al., 2022). However, as The Information Technology Center of MOE (2021; 2023) stated, these challenges are compounded by more concrete issues such as inadequate funding and the ineffective integration of e-learning into the educational curriculum.

Firstly, infrastructural constraints are still prevalent despite progress in technological enhancements. China academic HEIs, especially in remote and rural areas, grapple with deficient hardware and software resources (Ting, et al, 2018). This imbalance in technological infrastructure impedes the effective implementation of e-learning and restricts equal learning opportunities. Moreover, the persistent digital divide, particularly between urban and rural regions, exacerbates the situation. Disparities in high-speed internet access and digital resources obstruct efficient e-learning and worsen educational inequalities (Li, et al., 2017).

The quality assurance of e-learning is another major challenge. Academic HEIs lack standardized and robust quality assurance mechanisms, leading to significant variability in the quality of e-learning offerings (Ling & Ze, 2011; Zhang, et al., 2012; Wu & Li, 2020). This variability affects the learning experience and may deter faculty and students from fully embracing e-learning (Wu & Li, 2020).

Pedagogical adjustments also present a significant challenge. The transition to e-learning requires substantial pedagogical shifts, and some faculty members find it challenging to adapt their traditional teaching strategies to the online environment (Liu, et al., 2019; McConnell, 2017; Wang, et al., 2018; Tsegay, et al., 2022). Furthermore, students often require extra support adapting to self-directed online learning modes (McConnell, 2017; Wang, et al., 2018).

In addition to these challenges, The Information Technology Center of MOE (2021; 2023) highlights the inadequate funding allocated for implementing e-learning in academic HEIs. In 2021, the per capita information technology (IT) funding for academic HEIs was significantly lower compared to Double-First-Class universities and vocational HEIs. This trend continued into 2023, with a further decrease in funding for academic HEIs, highlighting the financial constraints. Moreover, academic HEIs consistently lag in integrating e-learning into their educational programs. In 2021 and 2023, academic HEIs displayed the lowest rates of adopting

synchronous learning, blended learning, and asynchronous learning compared to Double First-Class universities and vocational HEIs.

The integration of e-learning into China's academic HEIs faces several challenges. To enhance the efficacy and reach of e-learning in these institutions, China's academic HEIs need to address these challenges, focusing on improving infrastructure, bridging the digital divide, standardizing quality assurance mechanisms, facilitating pedagogical adjustments, and providing robust faculty training and support. Simultaneously, addressing the gaps in funding and ensuring the effective integration of e-learning into educational programs is of utmost importance (Li, et al., 2017; Li, et al., 2019; Ling & Ze, 2011; Liu, et al, 2019; Wang, et al., 2018; Zhao & Song, 2021)

### **2.5 Critical success factors for implementing e-learning**

It is vital to know that institutions, constrained by resources, can optimize their use by relying on a detailed set of Critical Success Factors (CSFs), ensuring that time, funding, and personnel are directed towards areas of highest impact (Paechter & Maier, 2010). One study, also, indicates that engaging stakeholders, from faculty to IT specialists, provides a wealth of insights and nurtures a collective commitment to e-learning initiatives (Lee, Yoon, & Lee, 2009). With CSFs as benchmarks, institutions can track their performance and make necessary adjustments, ensuring resilience and growth (Al-Jabri & Alabdulhadi, 2013). This understanding also empowers institutions to anticipate and respond swiftly to challenges (Cheng, 2011).

E-learning, being multifaceted, requires a balanced approach that addresses its technological, pedagogical, and organizational dimensions. A thorough set of CSFs ensures this balanced focus while being attuned to both global standards and local contexts (Roca, Chiu, & Martinez, 2006; Tarhini, Hone, & Liu, 2014).

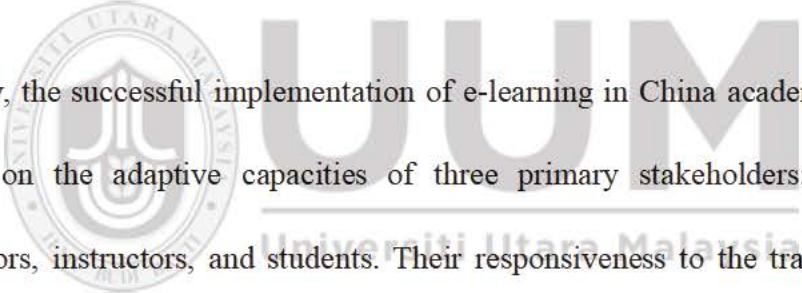
The role of Critical Success Factors (CSFs) in the successful implementation of e-learning within HEIs is a prominent theme in the scholarly literature on the topic. CSFs, as conceptualized by Rockart (1979), are the essential conditions that, when effectively met, ensure a successful outcome in any given project or organizational endeavor, in this case, the implementation of e-learning (Al-Adwan, et al., 2013).

Multiple studies have examined and identified critical success factors for the implementation of e-learning. Volery and Lord (2000) stated that technology (ease of access and navigation, interface and interaction), instructor characteristics (attitudes toward students, instructor technical competence, classroom interaction) and student characteristics (students' perception of e-learning) are three critical success factors affecting e-learning integration. Soong, et al. (2001) proclaimed that critical success factors can be categorized into five groups: human factors, instructors and learners' ICT competency, instructors and learners' attitudes toward e-learning, level of collaboration and technological infrastructure. Selim (2005) use confirmatory factor models to evaluate critical success factors and found out that eight critical success factors from students' perception determined effectiveness of e-learning and that they

can be grouped into four categories: instructor characteristics (attitudes toward e-learning and control of the technology, and teaching style), student characteristics (computer competency, interactive collaboration, and e-learning course content and design), technology (infrastructure and ease of access) and technical support (technical assistance, help desk, library and information availability). From the faculty-based survey, King and Boyatt (2014) concluded that institutional infrastructure, staff attitudes and skills and students' perception were identified as influencing factors for the adoption of e-learning.

Apart from above critical success factors for e-learning implementation, e-learning policy is also an indispensable part of successful e-learning institutional adoption (Cook, et al., 2007; Czerniewicz & Brown, 2009; Holt & Challis, 2007). Implementing policies centered on integration of e-learning especially building and ensuring quality in e-learning, researchers mentioned that four preeminent initiatives are fundamental objectives and they are providing technical support and guidance for students, professional development and support for teaching staffs, improving quality of e-learning content and leadership development (Brown, et al., 2007). Implementing and facilitating these four initiatives is enormously money-consuming and confirming costs and benefits of e-learning gives decision makers, university administrators and practitioners advantages in decision making especially when there is no practical evidence that indicated the cost-effectiveness of e-learning (Sharma, 2011). To understand costs and benefits of e-learning provides administrators and educators

insights about how to overcome barriers, start-up cost of e-learning (investment in IT facilities and technology, cost of digital content, and training fees) and running costs /recurring costs (technical support), to successful adoption of e-learning (Bacow, et al., 2012; Bell & Federman, 2013). As Lwoga (2014) points out, these factors directly influence the eventual success of the e-learning system, influencing crucial aspects such as learning outcomes, student satisfaction, and return on investment. However, the identification and management of these CSFs must be contextualized, given the susceptibility of CSFs to a range of influences, which includes the cultural, financial, and socioeconomic environments of a given institution (Bhuasiri, et al., 2012).



In summary, the successful implementation of e-learning in China academic HEIs is predicated on the adaptive capacities of three primary stakeholders: university administrators, instructors, and students. Their responsiveness to the transformative changes engendered by e-learning hinges upon a multitude of critical success factors. These factors span diverse dimensions, from policy-related elements (Brown et al., 2007; Czerniewicz & Brown, 2009) to financial, technical, and human considerations (Mapuva, 2009; Nurul, Martin, & Frances, 2015; Vershitskaya et al., 2019). Such an integrated perspective is instrumental in comprehensively addressing the complexities associated with e-learning implementation (Hu & Raman, 2024).

### **2.5.1 Adopting an integrative perspective for implementing e-learning**

It is pivotal to see that e-learning in higher education is influenced by a complex

amalgamation of human, technical, policy, financial and institutional factors, necessitating a broader evaluation beyond mere learning outcomes (Hu & Raman, 2024). An integrative perspective, combining more than two perspectives, elucidates how e-learning intertwines with wider societal dynamics, identifying funding avenues, affordability, and post-study employment opportunities (Daniel, 2016). Furthermore, this integrative perspective critically shapes feedback mechanisms, enhancing student interactions with content, peers, and educators, thereby prompting institutions to devise more effective feedback systems (Selwyn, 2011). For administrators and practitioners, comprehending this integrative context is crucial for crafting supportive e-learning policy for all stakeholders (Bates, 2015). An increasing number of studies reveal that effective integration of e-learning into higher education institutions (HEIs) necessitates addressing essential success factors across policy, financial, technical, and human dimensions (Brown et al., 2007; Czerniewicz & Brown, 2009; Mapuva, 2009; Nurul, Martin, & Frances, 2015; Vershitskaya et al., 2019). This holistic approach ensures fiscal sustainability and equitable access by tackling vital financial considerations and the evolving nature of technology, including necessary infrastructure and digital literacy (Nicol & Coen, 2003; Sharma, 2011; Steinberg, 2004; Boettcher, 2005; Pätzold, 2005). Effective e-learning policy prioritizes technical support for students, staff professional development, quality content, and leadership (Cook et al., 2007; Czerniewicz & Brown, 2009; Holt & Challis, 2007; Brown et al., 2007). It is also critical to grasp that equally crucial are human factors such as faculty attitudes, IT literacy, professional development, and students' digital competency and

attitudes (Esterhuizen et al., 2013; Mohammadyari & Singh, 2015; Tuevlljak, 2016; Baker, 2017). There is a pressing need to acknowledge the interconnection between e-learning and broader societal dynamics, this integrative perspective aids in formulating inclusive and effective policies, adapting to diverse learning preferences, and fostering continuous program improvement through feedback from learners, educators, and administrators. An integrative perspective, to summarize, encompassing policy, human, financial, and technical dimensions is indispensable for astute decision-making, sustainability, and the success of e-learning initiatives in HEIs (Hu & Raman, 2024).

## **2.5.2 Institutional support from an integrative perspective**

### **2.5.2.1 Financial factors that support e-learning implementation**

Financial considerations, funding strategies, are critical in the effective integration and continuous maintenance of e-learning systems within HEIs. There is a number of studies indicating that a comprehensive finance outlook embodies initial investments (start-up costs), running costs (recurring costs), and cost-effectiveness (cost-benefits) (Nicol & Coen, 2003; Sharma, 2011; Steinberg, 2004). This triad of financing factors significantly influences various dimensions of e-learning implementation. By gaining a nuanced understanding of e-learning costs, decision makers and university administrators can enhance e-learning initiatives while also economizing (Boettcher, 2005; Paatzold, 2005).

## **Initial investment**

Initial investment forms the cornerstone of e-learning implementation in HEIs. Various elements come under the purview of this investment, including monetary allocations, technological acquisitions, content creation, and faculty training. A wide range of research has shed light on these aspects of investment.

The technology infrastructure is a significant component of the initial investment (King, Dang, & Zhang, 2009). The selection of appropriate technology is critical, as it delineates the learning environment and fundamentally determines the success of the e-learning implementation. More extensive and complex e-learning projects demand proportionately larger initial investments in technology.

High-quality digital content also represents a critical element of the initial investment (Bates, 2015). The pedagogical efficacy of e-learning significantly hinges on the quality of the digital content employed. There is a pressing need to know that even though this investment might be considerable initially, it promises potential long-term savings, solidifying its position as a future-oriented investment.

Faculty training and support, to be added, have also been highlighted as essential components of the initial investment (Allen & Seaman, 2017; Lopes, 2018). Further, faculty often require substantial initial investments in training in e-learning technologies and pedagogical skills. Continuous support, critically and strategically, is

also fundamental to ensure faculty members can effectively utilize e-learning technologies and methods in their teaching.

To be added, regulatory compliance and accreditation costs also constitute a part of the initial investment (Bacow et al., 2012). No wonder that HEIs should incorporate these costs in their initial budgeting to prevent unexpected expenses in the future. It is critical to know that recent research has begun to highlight hidden costs, including time and effort spent by faculty in course preparation and delivery, as well as the time needed for students to acclimate to the e-learning environment (Garrett, et al., 2020).

These costs, in brief, are crucial in calculating the overall initial investment in e-learning.



### **Running costs**

Running costs are a key part of the implementation and sustainability of e-learning in HEIs. These include technology maintenance and upgrades, ongoing faculty training, course design, and learner support services (Grau-Valldosera & Minguillón, 2014; Bates, 2015; Salmon, 2011; Moore, Dickson-Deane, & Galyen, 2011; Simpson, 2013).

While these running costs may seem substantial, they ensure the relevance, effectiveness, and long-term sustainability of e-learning programs.

Maintaining and upgrading technology infrastructure is a major component of the running costs in e-learning. Studies suggest that these expenses can grow significantly

over time, indicating that budgeting for ongoing upkeep is as important as the initial technology purchase (Grau-Valldosera & Minguillón, 2014).

One factor that cannot be ignored is that staffing costs tend to be higher in e-learning compared to traditional education due to the need for roles such as instructional designers and IT support staff, as these roles enhance the e-learning process, and while they increase costs, they also potentially lead to better learning outcomes and improved efficiency (Bates, 2015).

To be added, ongoing faculty training and professional development represent another aspect of running costs. Given the rapid changes in e-learning technology and pedagogy, continuous training can enhance the quality of e-learning and boost student satisfaction, justifying the investment (Salmon, 2011).

The design and development of e-learning courses, under the financial radar, also contribute to running costs. This variable cost indicates that online and hybrid courses need frequent updating due to swift technological advancements and changing learner expectations, which can increase costs but also ensure the relevance and effectiveness of the e-learning program (Moore, Dickson-Deane, & Galyen, 2011).

Finally, learner support services, which include technical assistance and academic counseling, are essential and form part of the running costs. Even though these

services increase costs, they are instrumental in improving student retention and success rates, making them crucial for the success of e-learning (Simpson, 2013).

### **Cost-effectiveness**

Cost-effectiveness is fundamental for implementing e-learning and its ongoing management in HEIs. A cost-effectiveness analysis evaluates the outputs or outcomes of an e-learning initiative against its associated costs (Levin & McEwan, 2001). This enables efficient resource allocation, financial savings, and improved e-learning efforts (Rovai & Downey, 2010; Shelton, 2011; Stansfeld et al., 2009; Boettcher, 2005; Pätzold, 2005; Chipere, 2017; Mihai et al., 2021).

It is increasingly critical to see that the principle of cost-effectiveness is pivotal to implementing e-learning systems and their ongoing management in Higher Education Institutions (HEIs). As Levin & McEwan (2001) indicate, cost-effectiveness, financially and strategically, involves a comparative analysis of the outputs or outcomes of an e-learning initiative against its associated costs. This approach, thereby, can provide in-depth insights into the efficiency of resource utilization and the relative success of e-learning initiatives.

Focused on financial resource optimization, numerous studies underscore the importance of cost-effectiveness in the context of e-learning. As emphasized by Rovai & Downey (2010), Shelton (2011), and Stansfeld et al. (2009), it is not just about

instituting an e-learning system but also ensuring its sustainability over time. Its importance, proved in one empirical study, aligns with the recognition by the Online Learning Consortium, which considers cost-effectiveness a key criterion in assessing e-learning quality (Moore, 2005).

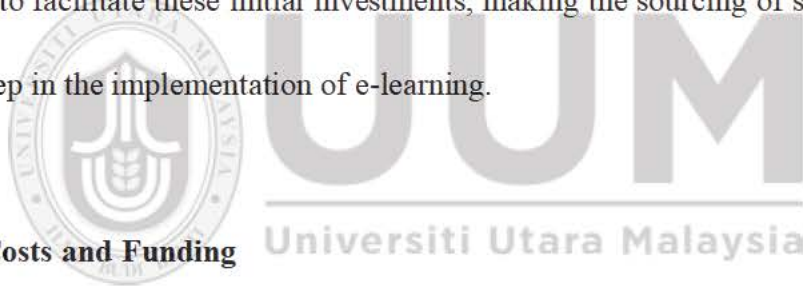
A cost-effective e-learning approach suggests efficient resource allocation, contributing to significant financial savings and improved e-learning efforts (Boettcher, 2005; Pätzold, 2005). Further evidence strengthens this statement, indicating that effective financial management is critical for the successful execution of e-learning, focusing on prudent financial planning and cost-efficiency (Chipere, 2017). In addition, valuing cost-effectiveness as a strategic objective in e-learning implementation frameworks can yield substantial financial savings, as evidenced in the research of Mihai et al. (2021).

Cost-effectiveness, in essence, is a lens through which to evaluate the financial efficiency of e-learning initiatives. There is a pressing need to build a thorough understanding of e-learning costs, prompting policymakers and university administrators to optimize e-learning efforts while curtailing costs. Placing a premium on cost-effectiveness, therefore, allows higher education institutions to facilitate, sustain, and continually enhance their e-learning systems. More importantly, the correlation and interdependence among these financial aspects and the provision of funding play a pivotal role in the successful and sustainable implementation of

e-learning.

### **Initial Investment and Funding**

Initial investment is the capital needed to set up an e-learning system. Such upfront costs usually include the necessary infrastructure, software development or procurement, the design and creation of digital learning materials, and faculty and staff training (Bates & Poole, 2003; Dennen, Darabi, & Smith, 2007). There is a urgent need to know that initial investment often poses a significant barrier for many institutions due to the sizeable outlay required. Adequate funding, accordingly, must be secured to facilitate these initial investments, making the sourcing of such funding a critical step in the implementation of e-learning.



### **Running Costs and Funding**

Once the e-learning system is in place, running or operational costs are incurred. These ongoing costs typically encompass expenses for maintaining and updating the e-learning system, such as costs for technical support, hardware and software updates, and faculty and staff training (Rumble, 2001; Zemsky & Massy, 2004). It is also inclusive of the costs related to student support services like virtual tutoring and counseling. Continual funding is crucial to cover these running costs, ensuring the quality and reliability of the e-learning services are maintained over time (Bates & Sangrà, 2011).

### **Cost-Effectiveness and Funding**

Cost-effectiveness is a critical concept in the economics of e-learning, involving an analysis of the outcomes or outputs of e-learning initiatives relative to the costs involved (Levin & McEwan, 2001). Such analysis can guide resource allocation decisions, influence the selection of specific technologies or course designs, and assist in the continuous evaluation and refinement of e-learning initiatives (Bacsich & Ash, 2000; Rumble, 2001). A comprehensive understanding of cost-effectiveness can provide a strategic edge to institutions by enabling effective financial management and maximization of the return on their e-learning investment (Bacsich & Ash, 2000).

### **Interplay among these elements**

The relationship between funding, initial investment, running costs, and cost-effectiveness is symbiotic and critically important. The level of funding directly impacts the extent of initial investment and the capacity to sustain running costs, which in turn influences the quality, scope, and accessibility of e-learning services (Bates, 2000). Initial investment decisions can have long-term implications for running costs and overall cost-effectiveness, highlighting the need for strategic planning and foresight (Zemsky & Massy, 2004). Simultaneously, running costs necessitate ongoing funding and effective management, influenced by cost-effectiveness considerations to ensure the sustainability of e-learning services (Bacsich & Ash, 2000).

### **2.5.2.2 Human factors that support e-learning initiatives**

From the perspective of human factors, not only faculty's professional development in IT literacy, pedagogical skills, and faculty's attitudes are critical but also students' attitudes and digital competency play a vital role in determining the effectiveness of e-learning because faculty's ICT competencies, attitudes toward e-learning and their abilities to synthesize digital contents with pedagogical skills give faculty flexibility to understand and address the convulsion of implementing e-learning and provide learners with support in communication, collaboration and learning tasks (Esterhuizen, et al., 2013). Students' digital literacy is strongly associated with learning performance of students in that individual digital competency on learners' performance and continuance intention on performance is positively correlated (Mohammadyari & Singh, 2015). Broadly, students' positive attitudes toward e-learning exert a sanguine influence on students' willingness to take e-learning-related courses (Tuevljak, 2016). Further, students who positively perceived the quality of courses and effective pedagogical skills actively participate in courses that incorporate e-learning (Baker, 2017).

#### **Faculty's IT Literacy**

Ertmer (2005) claims that a faculty's IT literacy significantly impacts the successful implementation of e-learning. The study suggests that a higher level of IT literacy among faculty often correlates with more efficient utilization of e-learning systems, thereby enhancing students' learning experience. However, this argument assumes a

direct relationship between IT literacy and e-learning implementation without considering mediating factors such as institutional support or infrastructure.

Contrarily, Kopcha (2012) emphasizes the role of ongoing professional development and support in enhancing faculty's IT literacy. The study reveals that sporadic IT literacy workshops are less effective than continuous, integrated professional development programs. These programs, which include continuous training, institutional support, and peer collaboration, foster a comprehensive development of IT literacy skills, supporting the efficient implementation of e-learning.

Another crucial perspective is offered by Reeves (2008), who advocates for an expanded definition of IT literacy. Reeves argues that IT literacy should go beyond mere functional skills to include critical and ethical dimensions. This broader conceptualization of IT literacy can empower faculty to utilize e-learning technologies in a more effective and ethical manner, enhancing the overall quality of e-learning.

Furthermore, Palloff and Pratt (2011) stress the importance of faculty's readiness to embrace new technology. They argue that professional development programs should address potential resistance to technology adoption among faculty members and encourage a positive attitude towards e-learning. Such an approach could enhance the effectiveness of professional development in IT literacy and promote successful e-learning implementation.

Ertmer (2005), Kopcha (2012), Reeves (2008), and Palloff and Pratt (2011) all emphasize different aspects of faculty's IT literacy in the context of e-learning. Ertmer (2005) focuses on the direct correlation between IT literacy and e-learning success, neglecting intermediary factors like institutional support. Kopcha (2012) counters this by highlighting the necessity of ongoing professional development and support, rather than sporadic workshops, to nurture comprehensive IT literacy skills. Reeves (2008) takes a broader approach by advocating for an expanded definition of IT literacy, encompassing critical and ethical dimensions, thus enabling faculty to utilize e-learning more effectively and ethically. Palloff and Pratt (2011) emphasize the faculty's readiness and positive attitude towards new technology, suggesting that these aspects should be integral to professional development programs to overcome resistance and promote successful e-learning implementation. All the above considered together, these perspectives illustrate the complex and multifaceted relationship between IT literacy and e-learning, underlining the importance of continuous development, broader understanding, and positive attitudes.

### **Faculty's professional development in pedagogical skills**

Moore and Kearsley (2011) highlight that the unique attributes of e-learning, such as geographical and temporal flexibility and reliance on technology, require a distinct set of pedagogical skills. Their argument underscores the need for e-learning-specific professional development programs for faculty members.

This viewpoint is further bolstered by Bates and Sangra (2011), who argue that training faculty in the specific pedagogical skills required for e-learning is a critical factor for the successful implementation of e-learning. They suggest that such training should focus on skills such as facilitating online discussions, creating engaging online content, and using technology to enhance learning.

However, Picciano (2017) offers a counterpoint, arguing that while the development of e-learning-specific pedagogical skills is important, foundational pedagogical skills such as understanding learning theories, developing clear learning objectives, and creating inclusive learning environments are equally crucial for e-learning. This perspective implies that faculty's professional development for e-learning should build upon existing pedagogical skills.

Additionally, the effectiveness of professional development programs is a topic of debate in the literature. Kenny et al. (2019) maintain that faculty's professional development is most effective when it is ongoing, integrated with the faculty's regular duties, and supported by the institution. They assert that "one-off" training sessions are less effective than continuous professional development programs.

Finally, Li & Akins (2005) note the role of faculty attitudes in the effectiveness of professional development in pedagogical skills. They propose that faculty members'

receptivity to learning new pedagogical skills and their attitudes toward e-learning can significantly impact the effectiveness of professional development programs. This suggests the need for these programs to address faculty attitudes and foster a positive view toward e-learning.

Moore and Kearsley (2011), Bates and Sangra (2011), Picciano (2017), Kenny et al. (2019), and Li & Akins (2005) collectively present a multifaceted view of faculty's professional development in the context of e-learning. Moore and Kearsley, along with Bates and Sangra, emphasize the need for specialized training in e-learning-specific pedagogical skills, such as facilitating online content and using technology creatively. Picciano balances this by asserting the importance of foundational pedagogical skills alongside e-learning-specific ones. Kenny et al. stress the effectiveness of continuous and integrated professional development, which opposed to isolated training sessions, and Li & Akins underscore the role of faculty attitudes and receptivity towards e-learning. Together, these perspectives highlight the complexity of developing faculty for e-learning, pointing to the need for a nuanced approach that blends specialized e-learning skills with foundational pedagogical principles, continuous support, and positive attitude cultivation.

### **Faculty attitudes toward e-learning**

Faculty attitudes toward e-learning significantly impact its successful implementation in Higher Education Institutions (HEIs). A wealth of research has been conducted

exploring this link, demonstrating a nuanced relationship. Broadly, faculty attitudes toward e-learning have been depicted as a pivotal factor in its implementation. In their study, Al-Fraihat, et al., (2020) find a strong correlation between faculty attitudes toward e-learning and its successful implementation. They argue that faculty who perceive e-learning positively are more likely to integrate it effectively into their teaching.

However, the reasons behind these attitudes and their impact on implementation are multifaceted. Teo, et al., (2019) assert that faculty's attitude towards technology, in general, significantly impacts their attitude toward e-learning. Their study suggests that faculty who are comfortable with and interested in technology are more likely to have positive attitudes toward e-learning.

Similarly, Zayim & Ozel (2015) underscore the impact of faculty's perceived usefulness and ease of use of e-learning technologies on their attitudes. They found that faculty members who believe e-learning can enhance their teaching and is easy to use are more likely to have a positive attitude toward it. Contrarily, Bolliger & Wasilik (2009) highlight faculty concerns about the increased workload and time commitment associated with e-learning, suggesting these factors can negatively influence faculty attitudes. They propose that HEIs should acknowledge and address these concerns to foster more positive attitudes toward e-learning.

In a longitudinal study, Baran, et al., (2011) find that faculty attitudes towards e-learning can evolve with exposure and experience. Initially, skeptical faculty members can develop a more positive attitude toward e-learning as they gain experience and observe its benefits. A critical component in shaping faculty attitudes is the provision of adequate support and professional development opportunities. According to Martin, et al., (2019), faculty who receive sufficient technical and pedagogical support tend to have a more positive attitude toward e-learning.

Faculty attitudes toward e-learning are pivotal to its successful implementation, with positive perceptions often correlated with effective integration. Various factors, including comfort with technology, perceived usefulness, workload concerns, and adequate institutional support, play a significant role in shaping these attitudes. Additionally, attitudes can evolve positively with exposure and experience, emphasizing the multifaceted and dynamic nature of faculty's relationship with e-learning.

### **Students' Digital Literacy**

Often defined as the ability to use, understand and create digital content, digital literacy among students plays a critical role in implementing e-learning in Higher Education Institutions (HEIs). Belshaw (2012) presented a comprehensive framework for digital literacy, including foundational literacy (ability to use basic software), informational literacy (ability to search and process information), and creative

production of content. The author posited that a higher level of digital literacy leads to improved academic outcomes in e-learning, emphasizing the importance of digital literacy in the e-learning context.

Gilster (1997) proposed one of the earliest definitions of digital literacy, which focuses on the ability to understand and use information in multiple formats from a wide range of sources when presented via computers. Given the complexity of the modern digital environment, the author argued that being digitally literate is essential for students in navigating and learning from e-learning platforms.

White and Le Cornu (2011) used the concept of "digital residents" and "digital visitors" to describe variations in students' digital literacy levels. The authors suggested that digital residents with a higher level of digital literacy are more likely to embrace and benefit from e-learning than digital visitors.

Jenkins et al. (2006) emphasized "participatory culture", where users interact and create new content, asserting that e-learning should encourage such culture. The authors highlighted that digital literacy includes social skills developed through collaboration and networking, which can greatly enhance the e-learning experience. Eshet-Alkalai (2004) proposed a five-type skill set model for digital literacy: photo-visual skills (reading instructions from visuals), reproduction skills (utilizing digital replicas), branching skills (constructing knowledge from non-linear

hypertextual navigation), information skills (evaluating the reliability and quality of information), and socio-emotional skills (understanding the "rules" that prevail in cyberspace). The study underscored that these skills are crucial for students. In sum, a high level of digital literacy among students enables the efficient use of e-learning platforms and creates a dynamic and interactive online learning environment. Developing students' digital literacy skills should be a strategic focus for HEIs implementing e-learning.

### **Students' attitudes toward e-learning**

Students' attitudes toward e-learning are recognized as one of the most influential factors affecting e-learning implementation in Higher Education Institutions (HEIs). A wealth of research has focused on understanding these attitudes and their impact on e-learning success. In their seminal study, Al-Fraihat, et al.,(2020) observed that students' attitudes significantly impact their willingness to accept and use e-learning systems. They pointed out that positive attitudes could lead to greater engagement, better academic performance, and more effective use of e-learning resources.

Liaw (2008) found a correlation between students' positive attitudes towards e-learning and their perceptions of its usefulness, ease of use, and satisfaction. The study further highlighted that these positive attitudes can foster self-directed learning and create a more constructive e-learning experience. Hussein (2011) examined students' attitudes toward e-learning about their computer literacy skills. The study

showed that students with a high level of computer literacy are more likely to hold positive attitudes toward e-learning. This research emphasized the need for HEIs to consider the students' IT literacy level when implementing e-learning systems.

Another research stream focused on the social aspects of students' attitudes. Sun, et al., (2008) reported that social influences, including peers' and teachers' attitudes toward e-learning, significantly impact students' attitudes and acceptance of e-learning. This underscores the importance of creating a supportive learning community for the successful implementation of e-learning.

Wang, et al., (2003) proposed a model linking students' attitudes toward e-learning with their behaviour intention to use e-learning systems. They suggested that positive attitudes towards e-learning are a predictor of students' intention to use and actual use of e-learning systems, thus playing a significant role in successful e-learning implementation.

On the contrary, negative attitudes can hinder e-learning implementation. Bhuasiri, et al., (2012) noted that factors such as poor system quality, inadequate user training, and insufficient user involvement could lead to negative attitudes toward e-learning and subsequent low usage of e-learning systems. In summary, the literature suggests that students' attitudes toward e-learning are a significant determinant of the

successful implementation of e-learning in HEIs. Thus, HEIs should prioritize understanding and improving these attitudes as a part of their e-learning strategies.

### **2.5.2.3 Technical factors that support e-learning initiatives**

From the technical perspective, scholars have examined various variables that affect the performance of e-learning implementation. These variables include technical assistance, information availability, e-learning environment, infrastructure, and ease of use. Mihai et al. (2021) and Al-araibi et al. (2019) underscore the significance of technical support in successful e-learning adoption. Mihai et al. (2021) advocate an integrative approach backed by technical assistance for students and instructors as a critical enabler of mature e-learning implementation at universities. This approach ensures that both parties possess the essential technical skills and resources to engage fully with e-learning platforms and tools. Similarly, Al-araibi et al. (2019) emphasize the pivotal role of technical skills and support, as inadequate assistance and infrastructure may hinder effective and efficient e-learning implementation.

### **IT Support**

IT Support is essential for implementing e-learning successfully in Higher Education Institutions (HEIs). Various researchers have studied this aspect, revealing its multifaceted significance. The study highlighted the importance of providing immediate and reliable technical assistance for faculty and students to facilitate the adoption and effective utilization of e-learning systems (Bennett & Green, 2001). This

study indicated that technical issues are a significant barrier to e-learning implementation, making it crucial for institutions to prioritize robust technical support systems.

Berge and Huang (2004) observed that high-quality technical assistance reduces technical anxiety among students and faculty, thus increasing their willingness to participate in e-learning. The authors suggested that technical support should not be a one-time event but a continuous service that includes troubleshooting, maintenance, and updates.

Ali and Ahmad (2011) explored how comprehensive technical support impacts the overall user experience in e-learning environments. They found that competent technical assistance, covering aspects from basic troubleshooting to advanced system management, fosters confidence among users and increases system usability, thereby contributing to the successful implementation of e-learning. In their research, Browne, et al., (2006) showed how technical assistance could serve as a bridge between the technology and its users. They argued that without adequate technical support, even the most advanced e-learning systems may fail due to user frustration or inability to utilize them.

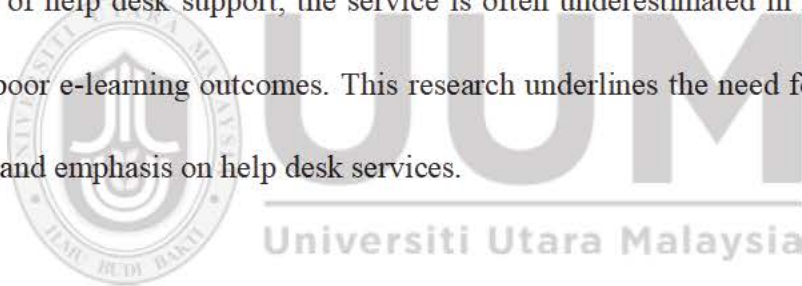
Looking at the broader institutional perspective, King and Boyatt (2015) suggested that technical assistance plays a strategic role in e-learning implementation, impacting

its sustainability and scalability. They argued that HEIs should invest in building strong technical support teams as they are instrumental in troubleshooting, maintaining, and upgrading e-learning systems, thereby ensuring their longevity and effectiveness. However, various studies pointed out that despite the apparent importance of technical assistance, many HEIs still struggle with providing consistent and efficient technical support, which can significantly hinder the successful implementation of e-learning (Almaiah, et al., 2020; Laguttseva-Nogina, et al., 2020; Putra et al., 2022; The Information Technology Center of MOE, 2020; 2021; Vershitskaya, et al., 2019). This study underscores the need for continuous improvement in technical assistance. In summary, the literature emphasizes the critical role of technical assistance in e-learning implementation in HEIs. As such, investing in competent technical support teams and continuous technical assistance should be a top priority for institutions wishing to succeed in their e-learning endeavors.

### **Help Desks & Library**

Support services like help desks and libraries are critical when implementing e-learning in Higher Education Institutions (HEIs). A study conducted by Balter, Enstrom, and Klingenberg (2013) found that the quality of help desk support significantly affect students' achievements and satisfaction in e-learning environments. They concluded that responsive and efficient help desk support reduces technical difficulties and enhances the learning experience.

Wagner, et al., (2008) stated that help desks not only troubleshoot technical issues but also guide users on how to utilize e-learning tools effectively. Their research suggested that high-quality help desk services could improve user confidence and encourage active participation in e-learning. On the faculty side, a study by Beaudoin (2002) emphasized the importance of help desk services in providing necessary support for the design and delivery of online courses. The author argued that the presence of efficient help desk services could facilitate smoother e-learning implementation. However, a study by Morgan (2003) showed that despite the importance of help desk support, the service is often underestimated in many HEIs, leading to poor e-learning outcomes. This research underlines the need for improved investment and emphasis on help desk services.



The role of libraries in e-learning is discussed by Kilgour (2001), who asserted that libraries are fundamental in supporting students' information needs in online learning. Digital libraries can provide resources and materials that enhance the learning experience and support the curriculum. A study by Arif and Mahmood (2012) revealed that providing remote access to a variety of resources, digital library help students overcome geographical and time constraints associated with traditional libraries. They argued that robust digital library systems can significantly enrich the e-learning experience.

Moyo (2004) investigated the role of libraries in faculty support for e-learning. The study concluded that one role that libraries offer are resources and guidance for course design and content development in e-learning environments. Despite their pivotal role, Pinto (2010) cautioned that many libraries face challenges when aligning their services with e-learning needs. The study recommended that libraries proactively upgrade their services, leading to better support e-learning implementation. In summary, help desks and libraries are crucial components of technical support systems in HEIs. Their functions, though often underestimated, are instrumental in ensuring a smooth, effective, and satisfying e-learning experience for students and faculty.

### **Information Accessibility**

The literature on information accessibility and its impact on e-learning implementation within Higher Education Institutions (HEIs) presents a complex and nuanced relationship. Information accessibility positively influences student engagement and achievement, but it simultaneously introduces challenges in discerning the quality and relevance of the information (Chen, 2017; Jones et al., 2018). The technological infrastructure's vital role is evident, yet its absence can create significant hindrances, especially in less-developed regions (Conole et al., 2004; Altbach et al., 2009). Digital literacy is essential for students to manage and utilize information effectively in an e-learning environment, though complexities related to information overload exist (Bruce, 1999; Bawden & Robinson, 2009). Nejkovic and

Tosic (2018) reinforce the importance of high-quality information and learning materials for successful e-learning systems. They argue that information accessibility must entail the provision of accurate, up-to-date, pertinent material, and engaging activities that enhance learners' understanding of concepts. Utilizing the Technology Acceptance Model (TAM) and DeLone and McLean's Information Systems Success (D&M ISS) model, their study confirms the quality of information and learning materials as a critical determinant of e-learning system success, offering valuable guidance to designers, developers, and educators. Moreover, the broader need for information accessibility must be thoughtfully balanced with concerns about data privacy and security (Solove, 2006). Collectively, these findings illustrate that increased information accessibility, while providing substantial benefits to e-learning, also necessitates meticulous management and awareness of the interconnected challenges among quality, accessibility, literacy, privacy, and the overall success of e-learning systems.

### **E-learning environment**

Researchers (Al-araibi et al., 2019; McNaught et al., 2009; Nejkovic and Tosic, 2018; Stefanovic et al., 2011) examine the features of e-learning environments that facilitate effective e-learning in higher education. Communication, interaction, and multimedia delivery are highlighted by some researchers (Al-araibi et al., 2019; McNaught et al., 2009; Nejkovic and Tosic, 2018; Stefanovic et al., 2011). Conversely, others (Alnabhan et al., 2014; Toktarova and Ivanova, 2015; Mihai et al., 2021) consider the

physical environment and learner resources, including technology, network connectivity, and user characteristics. These factors collectively contribute to e-readiness, a critical determinant of successful e-learning adoption.

E-learning implementation encounters challenges during planning, development, implementation, dissemination, and evaluation phases, stemming from human and organizational factors such as teachers, students, technology, environment, and culture (McNaught et al., 2009). These challenges often lead to unreported failures in e-learning projects. However, successful cases of complex e-learning projects emerge when teachers, students, and support teams collaborate seamlessly in the e-learning environment.



Infrastructure's impact on e-learning programs is examined in the studies of Kelland and Kanuka (2007), McNaught et al. (2009), and Mihai et al. (2021). While Kelland and Kanuka (2007) stress its critical role in determining e-learning effectiveness, McNaught et al. (2009) identify technical infrastructure as one of three organizational factors that can challenge e-learning programs. Mihai et al. (2021) propose a robust infrastructure, tightly integrated with university systems, as one of the five essential factors aiding effective blended learning initiatives. Despite varying emphases, all three studies highlight the significance of physical infrastructure in e-learning endeavors.

Designing user-friendly e-learning environments is vital for success. Ease of use (ease of use) refers to learners' ability to navigate and interact with the system effortlessly and understand its features without prior knowledge or experience (Nejkovic & Totic, 2018). Researchers (Abdel-WAHAB, 2008; EIDYS, 2021; Cigdem & Ozturk, 2016) agree that perceived ease of use (PEU) is a critical factor influencing students' adoption and use of e-learning systems. While definitions and measurements of PEU vary, all studies emphasize the importance of designing user-friendly e-learning systems to enhance student engagement and adoption.

### **Ease of use**

The ease of use of an e-learning system is a critical factor influencing its implementation in Higher Education Institutions (HEIs). Davis' (1989) Technology Acceptance Model (TAM) has been instrumental in understanding how perceived ease of use influences the adoption and effective implementation of e-learning. Davis asserts that if users find a system easy to use, they are more likely to accept and utilize it.

This theory is supported by Sun, et al, (2008), who conducted a study on e-learning in HEIs and found that the ease of use of e-learning systems directly influences students' acceptance and utilization of these systems. They concluded that designing user-friendly e-learning systems should be a priority to encourage active participation from students. On the faculty side, research by Teo (2010) echoed similar sentiments,

stating that teachers are more likely to integrate e-learning into their teaching practices if they find the system easy to use. Teo's research suggests that the simplicity and intuitiveness of e-learning tools directly impact their acceptance among educators.

Another noteworthy study conducted by Venkatesh, et al., (2003) extended the original TAM and created the Unified Theory of Acceptance and Use of Technology (UTAUT). The study found that ease of use was not just pivotal for initial adoption but also significantly impacted long-term usage and engagement with e-learning systems. However, while ease of use is important, Park (2009) argued that it should not compromise the functionality and versatility of e-learning platforms. Park's study advised that while systems should be user-friendly, they should also provide advanced features and customizability for more tech-savvy users and complex tasks.

In summary, the ease of use of e-learning systems is a crucial factor affecting their implementation in HEIs. Both students and faculty are more likely to embrace e-learning if the system is perceived as easy to use. As such, user-friendly design should be a paramount consideration in the development and selection of e-learning systems in HEIs.

### **2.5.3 Challenges arising from financial, human, and technical factors in China academic HEIs**

#### **Funding-related challenges**

E-learning has emerged as a crucial component within the educational systems of numerous countries, China being a prominent example. This instructional modality offers salient benefits such as improved accessibility and enhanced flexibility. However, integrating e-learning into China's academic HEIs faces challenges. A particularly vexing issue pertains to funding, which presents multiple challenges. This scholarly review will analyze the multifaceted financial challenges associated with e-learning in China's academic HEIs. Specific areas of investigation will include the allocation of monetary resources, long-term sustainability, and disparities in funding across various institutions.



One of the primary challenges of e-learning implementation in China is the inadequate funding allocated for implementing e-learning in academic HEIs (The Information Technology Center of MOE 2021; 2023). Many academic HEIs often struggle to secure adequate funding to develop and sustain e-learning programs. This has led to a digital divide, whereby well-funded institutions such as double first-class universities are able to provide more robust e-learning programs, while others lag behind (Ting, et al, 2018).

E-learning implementation requires not only initial funding but also ongoing support for maintenance, updates, and continuous improvements. A lack of continuous financial support can hamper the sustainability of e-learning programs in Chinese HEIs. The financial burden includes technology maintenance, content development, faculty training, and support services, all of which require sustainable funding models. That academic HEIs allocate running costs for ongoing support for maintenance, updates, and continuous improvements further compound the challenges of incorporating e-learning into academic HEIs (The Information Technology Center of MOE 2021; 2023; Wang, et al., 2018; Zhao & Song, 2021).

The disparity in funding between well-resourced and under-funded institutions further exacerbates inequality in e-learning provision. Elite universities (Double First-class universities) often receive substantial governmental support and private investments, while academic HEIs face significant funding constraints (Ting, et al, 2018). This results in unequal opportunities for students and could potentially affect faculty's professional development, student engagement, and learning outcomes.

### **Human-factor-related Challenges**

In China's academic HEIs, the integration of e-learning presents several challenges related to faculty's digital literacy. The migration to online platforms amplifies their workload, demanding a re-conceptualization of content and continuous student engagement. Furthermore, the time-intensive nature of crafting online activities often

clashes with existing teaching and administrative responsibilities, potentially impacting e-learning quality. Even experienced educators might grapple with self-doubt when navigating unfamiliar e-learning landscapes(Zhao & Song, 2021). This unease is compounded for those lacking foundational ICT skills and prior online teaching exposure (Huang, 2020; Tsegay, et al., 2022; Wang, et al., 2018). To surmount these challenges, comprehensive professional development, marrying technological instruction with pedagogical support, is imperative.

In the meanwhile, the evolution towards digital learning presents multifaceted challenges for faculty's professional development in pedagogy. Primarily, there is a marked deficiency in curriculum and instructional design training, which is essential for creating cohesive e-learning courses(Liu, et al, 2019). This is exacerbated by the transition from traditional cognitive behaviorist approaches to more interactive social-constructionist and connectivist pedagogy; many in-service faculty lack the requisite training for this pedagogical shift. Historically, roles like "pedagogical faculty" were not intrinsic to the CRVTU system, adding to the confusion(Li, et al., 2017). The blended learning environment, which combines traditional and online teaching, often stumps faculty in personalizing content for diverse learners (Li, et al., 2019). Additionally, fostering effective group discussions online, ensuring consistent student engagement, managing participation, and offering consistent feedback emerge as pronounced challenges(Ding, et al., 2010, Fu, 2022; Tsegay, et al., 2022). This

multi-faceted issue demands a holistic approach to professional development, emphasizing both technology and pedagogical nuances.

In China's HEIs, enhancing students' digital literacy for effective e-learning implementation presents distinctive obstacles. One central issue is the difficulty in predicting and catering to diverse student learning styles in an online setting, which can significantly influence the efficacy of digital instruction (Fu, 2022). Moreover, the blended learning approach, an amalgamation of traditional and online teaching methods, places an implicit demand on students to exhibit greater autonomy, self-regulation, and independence (Chen, 2017). While these are crucial skills for the digital age, not all students inherently possess them or have been trained to develop them, making their transition to a broader e-learning environment potentially tumultuous. This calls for a more holistic approach to digital literacy, ensuring students are not only technically adept but also prepared for the self-driven nature of e-learning.

In China's academic HEIs, fostering collaboration between students and faculty in an increasingly digital landscape poses distinct challenges. One primary concern is the diminished emotional interaction in online settings (Tsegay, et al., 2022), where nuances of face-to-face communication, essential for building trust and understanding, are often lost (Huang, 2020). This lack of direct interaction hinders collaborative learning, a crucial aspect of modern pedagogy, as it promotes peer-to-peer knowledge

exchange and collaborative problem-solving. Large class sizes exacerbate the situation, making it challenging for teachers to give individual attention, leading to poor staff-student contact. This impersonal environment often results in inconsistent feedback quality and quantity, impacting students' learning outcomes (Chen, 2017). Furthermore, many faculty struggle to maintain student interest and engagement in the virtual realm, a testament to the need for enhancing teacher-student interaction competencies in online settings (Tsegay, et al., 2022). Overall, the absence of face-to-face interactions and the subsequent challenges it brings underscores the urgency for HEIs to develop strategies and tools that can replicate, as closely as possible, the interactive experiences of traditional classrooms in online environments.

### **Technical-factor-related Challenges**

Challenges related to technical issues in China academic HEIs span a broad spectrum, reflecting various aspects of e-learning integration. First, the dearth of ICT skills and online teaching experience in the teaching community hampers the smooth transition to e-learning, often necessitating external technical support for course design and implementation (Liu, et al., 2019; McConnell, 2017; Wang, et al., 2018; Tsegay, et al., 2022). The limited confidence among faculty in executing e-learning further exacerbates the situation (Zhao & Song, 2021).

Another significant challenge lies in establishing a comprehensive digital infrastructure. This encompasses resources, service support, and fostering social

learning environments conducive to digital interactions (Li, et al., 2017; Fu, et al., 2022). The language barrier compounds the issue; the dominance of English in digital resources can alienate non-English proficient Chinese learners (Ling & Ze, 2011).

The absence of standardization in creating digital learning resources presents an issue of quality assurance and compatibility across platforms (Ling & Ze, 2011; Zhang, et al., 2012). This lack of uniformity disrupts the consistency of e-learning experiences, undermining the perceived quality and prestige of e-learning initiatives. Furthermore, ensuring both staff and students are digitally capable and that such capabilities elevate the learning experience emerges as a pivotal concern (Li, 2019; Zhao & Song, 2021). More importantly, infrastructure remains at the heart of e-learning. Building and maintaining the technical foundation is paramount, especially as e-learning becomes an alternative access mode for students who cannot physically attend prestigious institutions (Li, et al., 2017).

## **2.6 Attitudes of faculty and students toward institutional support mandated by e-learning policy in HEIs**

The perceptions of both faculty members and students profoundly impact the successful integration and efficacy of e-learning within higher education institutions (HEIs). Faculty members, who are often entrenched in traditional pedagogical methods, frequently exhibit reservations regarding e-learning, driven by concerns over maintaining educational quality and the potential erosion of face-to-face interactions. This apprehension is further compounded by the substantial effort

required to transition and adapt to novel digital platforms (Bolliger & Wasilik, 2009; Allen & Seaman, 2013). Conversely, students who are digital natives tend to perceive e-learning as a flexible and empowering modality, enabling personalized experiences and the ability to juggle multiple commitments (Dahlstrom, Brooks, & Bichsel, 2014). The attitudes of faculty members and students towards institutional support for e-learning are markedly influenced by factors such as technological infrastructure, institutional policy, and personal experiences with e-learning platforms. Faculty perceptions of e-learning are closely tied to their evaluation of institutional support. When institutions provide substantial backing, encompassing training, technical assistance, and incentives for developing online courses, faculty members are more inclined to view e-learning favorably. As elucidated by Wingo et al. (2017), faculty engagement in e-learning initiatives is heightened when they perceive robust institutional endorsement and support. This support can manifest in various forms, including professional development opportunities, access to advanced e-learning technologies, and the recognition of online teaching in promotion and tenure decisions. Conversely, inadequate institutional support can breed resistance among faculty. A deficit in training, insufficient technical support, and the perception that online teaching is undervalued compared to traditional face-to-face teaching can engender negative attitudes. Faculty may feel overwhelmed by the demands of online course design and delivery without adequate institutional backing. Additionally, doubts regarding the quality of education and the efficacy of e-learning platforms can further influence faculty attitudes. When faculty question the capacity of e-learning to deliver

high-quality education, their enthusiasm for adopting these technologies diminishes. Similarly, students' attitudes toward e-learning are significantly impacted by the level of institutional support they perceive. Positive experiences with e-learning are often associated with well-structured courses, reliable technology, and accessible support services. Students tend to value e-learning for its flexibility and convenience, allowing them to balance their studies with other commitments. According to Bolliger and Wasilik (2009), student satisfaction with e-learning increases when they receive timely technical support and when the online learning environment is user-friendly. Conversely, students may develop negative attitudes toward e-learning if they encounter frequent technical issues, poorly designed courses, or a lack of interaction with instructors. The sense of isolation and the absence of a traditional classroom environment can also detract from their e-learning experience. Institutions that fail to address these concerns risk alienating students from online education. Research by Song, et al. (2004) suggests that students' readiness for e-learning, including their technical skills and ability to manage time effectively, plays a crucial role in their attitudes. Institutional support in enhancing these skills can therefore improve students' perceptions of e-learning.

The attitudes of faculty and students toward institutional support for e-learning underscore a critical area for educational policy and practice. Institutions that invest in comprehensive support systems for both faculty and students are more likely to cultivate positive attitudes and successful e-learning outcomes. This support includes

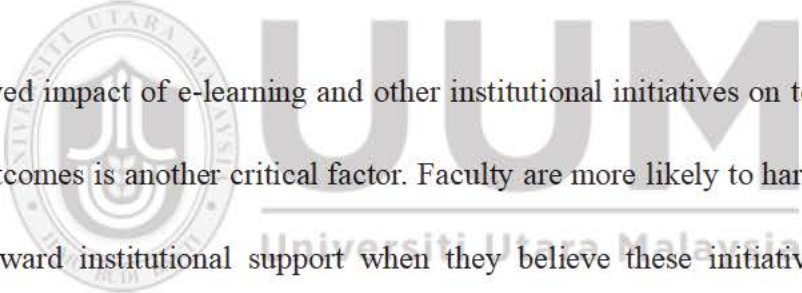
providing adequate training, ensuring reliable technological infrastructure, and recognizing the efforts of faculty in online teaching. Conversely, neglecting these support systems can lead to resistance and dissatisfaction, undermining the potential benefits of e-learning. For instance, Mitchell et al. (2015) emphasize the importance of institutional commitment to creating a supportive e-learning environment, arguing that both faculty and student buy-in is essential for the success of online education initiatives.

### **2.6.1 Faculty's attitudes toward institutional support mandated by e-learning Policy**

Faculty attitudes toward institutional support are pivotal for the successful implementation of educational policies, particularly in the domain of e-learning and digital transformation. Concerns about the adequacy of resources, such as access to contemporary technology, reliable technical support, and sufficient funding, are frequently cited by faculty as critical factors influencing their willingness to adopt e-learning tools. The absence of these resources can engender frustration and resistance, as faculty may feel ill-prepared to integrate new technologies into their pedagogical practices. Studies indicate that institutions providing robust technological infrastructure and continuous technical support tend to foster more positive faculty attitudes toward institutional support (Maguire, 2005).

Administrative support also significantly influences faculty attitudes. Institutions that

cultivate a supportive administrative environment, characterized by clear communication, transparent decision-making processes, and recognition of faculty efforts, tend to have faculty with more favorable attitudes toward institutional initiatives (Kezar & Sam, 2010). Conversely, perceived lack of or inconsistent administrative support can engender skepticism about the institution's commitment to supporting faculty professional needs and educational goals (Garrison & Vaughan, 2008). Professional development opportunities are crucial in shaping faculty attitudes, as effective programs aligned with faculty needs and schedules can enhance skills and confidence in utilizing new technologies (Guskey, 2002).



The perceived impact of e-learning and other institutional initiatives on teaching and learning outcomes is another critical factor. Faculty are more likely to harbor positive attitudes toward institutional support when they believe these initiatives enhance student engagement, learning, and satisfaction (Kirkwood & Price, 2013). Conversely, if faculty perceive that institutional initiatives prioritize administrative goals over genuine educational benefits, their attitudes can become negative (Wingo et al., 2017). Challenges such as inadequate time, resistance to change, and lack of autonomy also hinder the development of positive faculty attitudes, making it essential for institutions to address these issues (Georgina & Olson, 2008; Ertmer, 1999; Cuban, 2001).

To cultivate positive faculty attitudes toward institutional support, several best

practices have been identified. These include engaging faculty in the planning and implementation of e-learning initiatives, which increases buy-in and fosters positive attitudes (Fullan, 2007). Providing tailored support that addresses specific faculty needs and contexts enhances perceptions of institutional support (Mishra & Koehler, 2006). Recognizing and rewarding faculty efforts to integrate new technologies and participate in professional development can motivate faculty and foster positive attitudes (Schifter, 2000). Additionally, establishing mechanisms for continuous feedback and improvement ensures that institutional support remains relevant and effective, enabling adaptive responses to evolving needs and contexts (Eib & Miller, 2006).



### **2.6.2 Students' attitudes toward institutional support mandated by e-learning policy**

The integration of e-learning in higher education has revolutionized the educational paradigm, providing unparalleled flexibility and access to a plethora of resources. Students' perceptions of institutional support for e-learning are paramount in determining the efficacy of these initiatives. Favorable perceptions are typically correlated with access to dependable resources, robust technical support, and adept instructors. According to Allen and Seaman (2017), the quality and accessibility of digital resources profoundly influence students' satisfaction with e-learning. Additionally, extant literature (Igbaria et al., 1997; Masrom, 2008; Ngai et al., 2007; Selim, 2005; Venkatesh & Davis, 2000) underscores the critical importance of prompt

and efficacious technical support, which can significantly enhance the e-learning experience.

Instructor training and engagement are also pivotal in shaping students' attitudes. When instructors are well-trained and actively engaged, students are more inclined to have positive perceptions of e-learning. Martin, Budhrani, and Wang (2019) assert that instructor presence and interaction are essential to student satisfaction and learning outcomes. Moreover, transparent and supportive administrative practices contribute to favorable attitudes. Institutions that provide clear communication, flexible policies, and responsive support tend to cultivate a more conducive e-learning environment, as noted by Sun et al. (2008).

Despite these efforts, challenges such as the digital divide and the quality of online content persist. Students from lower socioeconomic backgrounds or remote areas may lack access to essential e-learning tools, leading to adverse attitudes towards institutional support (Van Dijk, 2020). Furthermore, the perceived quality of online courses and materials can significantly impact student satisfaction. Poorly designed courses and outdated content can lead to dissatisfaction, emphasizing the necessity for institutions to invest in high-quality, engaging, and contemporary online content (Baldwin, Ching, & Hsu, 2018). Mental health and well-being are also crucial considerations, with issues like isolation and screen fatigue affecting students' attitudes towards e-learning support (Son et al., 2020).

To augment institutional support for e-learning, it is imperative to ensure that all students have access to the requisite tools and resources. This includes providing hardware, software, and internet access to those in need (Van Dijk, 2020). Comprehensive training programs for both students and instructors can enhance proficiency and confidence in utilizing e-learning platforms (Martin et al., 2019). Furthermore, investing in the development of interactive, high-quality online materials that cater to diverse learning styles can enhance the overall e-learning experience (Baldwin et al., 2018). Lastly, offering holistic support services, including technical assistance, academic advising, and mental health resources, can address various challenges and foster positive attitudes towards e-learning (Son et al., 2020).

### **2.7 Research gaps identified by literature review**

This literature review underscores the significance of developing a comprehensive perspective when implementing e-learning practices and evaluating e-learning policy (Al-Jabri & Alabdulhadi, 2013; Cheng, 2011; Hu & Raman, 2024; Paechter & Maier, 2010). These critical success factors categorized under human aspects-instructor & student characteristics, and collaboration (Boyatt, 2014; Selim, 2005; Soong, et al., 2001; Volery & Lord, 2000), financial aspects-initial investment, running costs, cost-effectiveness (Nicol & Coen, 2003; Sharma, 2011; Steinberg, 2004), infrastructure (Kelland & Kanuka, 2007; McNaught et al., 2009; Mihai et al., 2021), and technical aspects-technical assistance, information availability, e-learning

environment, ease of use (Igbaria et al., 1997; Masrom, 2008; Ngai et al., 2007; Selim, 2005; Venkatesh & Davis, 2000). Previous studies have identified challenges in the financial, human, and technical areas that further complicate the implementation of e-learning at China academic HEIs. These challenges include the absence of standardized quality assurance mechanisms, the need for pedagogical shifts during the transition to e-learning, insufficient funding allocation, disparities between well-resourced and under-resourced institutions, amplified workloads due to online migration, curriculum and instructional design deficiencies, difficulties in catering to diverse learning styles, reduced emotional interaction, challenges posed by large class sizes, struggles to maintain student engagement, and inadequate ICT skills and online teaching experience. To fully understand how to cope with these challenges, a solid conceptual framework for crafting strategic e-learning policy (Figure 1.0) is established according to existing theories, previous studies and evaluation of various e-learning models.

The literature reveals three significant research gaps. The first pertains to a deficient understanding of institutional e-learning policy within Chinese HEIs, particularly concerning the attitudes of students and faculty towards the institutional support mandated by these policies. While broader perspectives on e-learning implementation have been extensively examined, there is a conspicuous scarcity of empirical investigations into attitudes specifically related to the mandated institutional support. Notably, qualitative explorations of faculty viewpoints on this mandated support

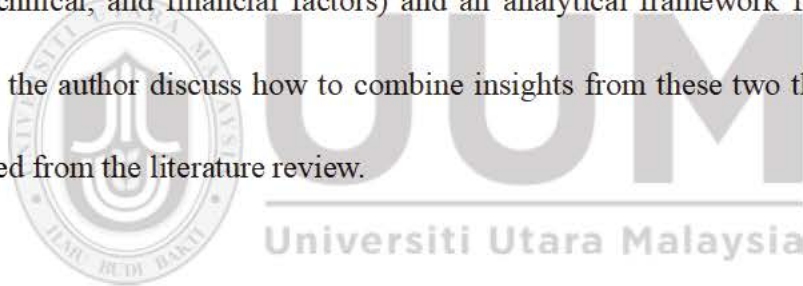
within Chinese academic HEIs remain limited, likely overshadowed by the prevailing focus on general attitudes towards e-learning implementation. This gap underscores the imperative to elucidate the perspectives of students and faculty regarding the institutional support required by e-learning policies during their integration into academic practice.

A second gap concerns the insufficient understanding of the interrelation between macro-level and institutional e-learning policies in Chinese higher education. Specifically, this involves the adaptation of institutional e-learning policies to the technological and pedagogical requisites delineated by the Education Informatization 2.0 initiative. Addressing this gap is vital for cultivating a more sophisticated understanding of the implementation and impact of these national directives within the context of Chinese higher education. Insights gained from such an inquiry could provide invaluable guidance for faculty, practitioners, and administrators, empowering them to refine and enhance institutional e-learning policies to ensure they are effective, inclusive, and aligned with national educational goals.

Lastly, there is a notable deficiency in research that comprehensively evaluates e-learning policy in the Chinese context from financial, human, and technical perspectives. This oversight complicates the challenges associated with e-learning implementation. Bridging this gap is crucial for fostering the successful integration of e-learning within China's intricate educational framework.

## 2.8 The conceptual model of institutional e-learning policy

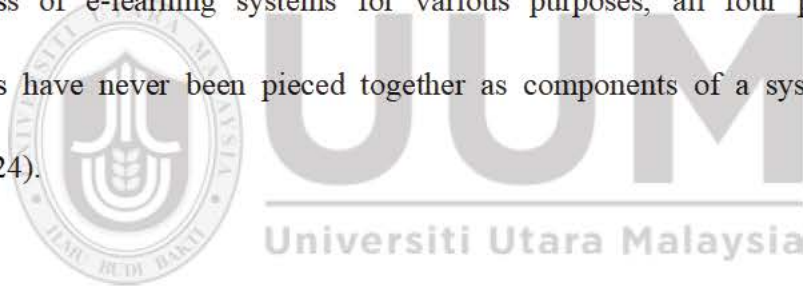
The researcher thoroughly and cautiously evaluates some theories for their potential relevance to this study. Among them, two theories are identified highly relevant. They are Freeman's stakeholder theory (1984) and Activity theory. Stakeholder theory, a network analytical theory, provides a framework for addressing the complex needs and interests of various groups-students, faculty, administrators, and IT specialists while evaluating the effectiveness of existing e-learning policy. Activity theory provides a systemic lens to investigate the dynamic interplay between components (human, technical, and financial factors) and an analytical framework for decoding data. Then, the author discuss how to combine insights from these two theories with those derived from the literature review.



Outlined as a framework to guide the process of data collection and analysis in this paper, the conceptual model promotes understanding of institutional e-learning policy at China academic HEIs. **Figure 2.6** presents a conceptual model of this dissertation, which combined insights derived from the two theories (stakeholder theory & activity theory, which have been thoroughly discussed in the section 2.10 and 2.11 of the Chapter II), and literature review such as evaluation of existing theoretical models and a set of Critical Success Factors (CSFs) categorized into an integrative perspective (policy, human, financial and technical factors). All factors are classified into three levels, and they are macro, organizational, and individual level, while some factors

(institutional e-learning policies and human factors) are demonstrated at two levels (organizational and individual level).

**Figure 2.6** indicates the model that navigated this study in the context of China's academic HEIs. The conceptual model provides a solid basis for five research questions. The model postulates that under the guidelines of Education Informatization II, institutional e-learning policy interacts with financial, technical, and human factors, facilitating the improvement of teaching and learning outcomes at China's academic HEIs. While a number of conceptual models examined the effectiveness of e-learning systems for various purposes, all four predominant components have never been pieced together as components of a system (Hu & Raman, 2024).



### **2.8.1 Insights from existing e-learning models**

Insights include a rigorous analysis of existing theoretical models, with attention given to those that address the integration of technologies (Puentedura, 2006), assess institutional readiness for e-learning implementation capabilities (Marshall & Mitchell, 2007), delineate the requisite knowledge that educators should possess to adeptly weave technology into their pedagogical practices (Mishra & Koehler, 2006). The construction of this conceptual model is informed not solely by collating insights from prior literature that discuss CSFs and e-learning implementation models. It also integrates ideas derived from Nicol & Coen's cost-benefit model (2003), Steinberg's

e-learning business model (2004), and Sharma's exploration into the cost factors associated with e-learning systems (2011).

Firstly, the SAMR Model, E-Learning Maturity Model (eMM), and TPACK Framework each provide distinct approaches to e-learning and technology integration in education (See table 2.5). A critical discussion of these models are showed on the following.

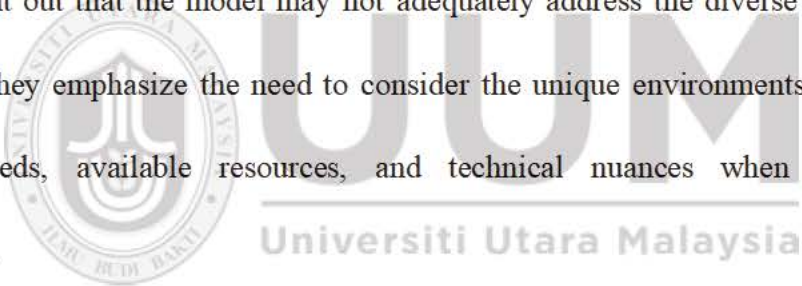
Table 2.5 Strengths and Weaknesses of three theoretical frameworks

Model	Applicability	Strengths	Weaknesses
SAMR Model (Substitution, Augmentation, Modification, Redefinition)	Guides educators in integrating technology by categorizing activities into Substitution, Augmentation, Modification, or Redefinition. It is used to enhance teaching and learning experiences by promoting transformative technology use	Clear Hierarchical Structure & Focus on Transformation (Puentedura, 2006)	Linear Progression and Overemphasis on Higher Levels & Inadequate Consideration of Pedagogy (Cepeda-Moya & Argudo-Serrano, 2022) Limited Contextual Considerations (Hamilton, Rosenberg, & Akcaoglu, 2016)
E-Learning Maturity Model (eMM)	Assesses an institution's e-learning capabilities. It is applicable in higher education to guide strategic planning, resource allocation, and quality enhancement efforts, promoting the maturity and effectiveness of e-learning initiatives.	Strategic Planning and Evaluation & Stages of Maturity (Ward et al., 2010)	Simplicity and Lack of Nuance & Limited Emphasis on Pedagogy (Nguyen & Koo, 2016) Static Nature (Ally & Samaka, 2013)
TPACK Framework (Technological Pedagogical Content Knowledge)	Applied in education to guide teachers in effective technology integration. It focuses on the dynamic interplay between technological, pedagogical, and content knowledge, enhancing instructional practices within specific subject matter contexts.	Integration of Disciplines & Dynamic and Adaptive Nature (Mishra & Koehler, 2006)	Presumption of Intersectionality (Archambault & Barnett, 2010) Limited Consideration of Context (Voogt et al., 2013)

The SAMR framework introduces the idea of a "Clear Hierarchical Structure," representing a structured progression from fundamental to advanced stages. This structure ensures that each subsequent step builds on the previous one, allowing educators to start with basic concepts and move to more complex ones based on their expertise and the evolving needs of the learners (Puentedura, 2006). Central to

Puentedura's argument is the "Focus on Transformation," emphasizing that technology should do more than mimic traditional teaching methods.

In contrast, Cepeda-Moya and Argudo-Serrano (2022) highlights potential limitations of the SAMR Model, particularly its linear approach to technology integration. They suggest that emphasizing the progression towards higher levels, such as Redefinition, the foundational stages, such as Substitution, may be undervalued. they also believes that the SAMR Model might not give enough attention to pedagogy, the art and science of teaching. Furthering this critique, Hamilton, Rosenberg, and Akcaoglu (2016) point out that the model may not adequately address the diverse educational contexts. They emphasize the need to consider the unique environments, individual student needs, available resources, and technical nuances when integrating technology.



The eMM offers a structured approach to assess an institution's e-learning capabilities, aiming for strategic planning and evaluation. This framework aids institutions in pinpointing strengths, recognizing weaknesses, and highlighting areas demanding enhancement in their e-learning endeavors, as discussed by Ward, et al. (2010). Furthermore, eMM categorizes e-learning growth into discernible stages of maturity, assisting institutions to navigate their journey from rudimentary to sophisticated e-learning practices. Such a delineated progression furnishes institutions with a directive for ceaseless advancement in digital education, as Ward et al. (2010) noted.

However, the model is not without criticisms. Nguyen & Koo (2016) posit that the model's straightforward nature might inadvertently trivialize the intricate facets of e-learning. Its overarching focus on maturity stages might miss out on capturing the detailed challenges distinctive to various educational establishments. Additionally, while the model thoroughly considers technological infrastructure and organizational elements, it might inadvertently sideline pedagogical aspects, potentially neglecting the synergy of technology with efficacious pedagogical methods. Lastly, Ally & Samaka (2013) caution about the inherent static nature of such maturity models. Given the swift evolution of technology and e-learning methods, eMM's unchanging structure may diminish its applicability as the educational landscape transforms.

The TPACK framework seamlessly blends technological, pedagogical, and content knowledge, offering educators a holistic model. This integration underscores the interconnected nature of these domains and steers educators towards efficacious incorporation of technology into teaching, as highlighted by Mishra & Koehler (2006). Furthermore, TPACK underscores the evolving essence of technology-augmented teaching, necessitating periodic introspection and adaptation to the shifting contours of educational tech.

However, the model has its downsides. Some, like Voogt et al. (2013), believe that TPACK's intricate design complicates its measurement, given that it traverses multiple

knowledge spheres, making its assessment potentially biased and varying based on the context. Archambault & Barnett (2010) question TPACK's fundamental premise, suggesting that the interplay among technological, pedagogical, and content expertise might not always materialize as educators could be adept in one domain but not others. Lastly, Voogt et al. (2013) state that TPACK could better account for contextual variables, emphasizing that the model's potency might oscillate based on the teaching environment, learner demographics, and subject nuances.

The synthesized information about the SAMR Model, E-Learning Maturity Model (eMM), and TPACK Framework offers valuable insights for understanding institutional e-learning policy that assesses technical and financial aspects while also taking students' and instructors' characteristics into account. The SAMR Model underscores that technology introduction is merely the initial step; institutions must focus on a transformative use of technology that enhances and redefines traditional pedagogical practices, highlighting the need for policies to promote advanced, purposeful technology integration. In line with the eMM's emphasis, institutions should continuously gauge and augment their e-learning capabilities, ensuring policies reflect best practices in technical and financial infrastructures. The TPACK Framework's spotlight on the intersection of technology, pedagogy, and content suggests that policies must ensure a balanced approach where technology complements curriculum and pedagogy, reinforcing the importance of ongoing professional development for faculty. Furthermore, these models collectively stress

the significance of financial planning and allocation in e-learning, prompting institutions to craft policies that consider technological investments and requisite training. The integral roles of students and instructors in the e-learning ecosystem, as accentuated by SAMR and TPACK, necessitate policies that furnish both demographics with comprehensive support, such as technical and financial support. The eMM's maturity-focused approach reminds institutions that e-learning evolution is continual, mandating feedback-oriented policy mechanisms for regular enhancement of practices. To encapsulate, when shaping institutional policies, it is pivotal for administrators to advocate pedagogically-aligned technology integration, recurrent e-learning capability assessments, robust support structures for relevant stakeholders, and a sustainable financial strategy.

## **2.8.2 Insights from extant literature review**

### **2.8.2.1 Education Informatization 2.0**

The educational and e-learning policies have played an increasingly vital role that dictates how universities promote e-learning content, organize technical support, allocate financial resources for e-learning services, and how instructors and learners perceive and implement e-learning (Roumell & Salajan, 2016; Welle-Strand & Thune, 2003). From the broad level of e-learning policy, governments intend to help universities not only build strength and gain competitive advantages in global communities but also seize opportunities for fund-raising and integrate computer

technologies into educational programs for the betterment of domestic higher education (Roumell & Salajan, 2014).

In China, Education Informatization II, the overarching e-learning policy at the macro level, supported by a spectrum of educational legislation, is a vital mechanism to guide academic HEIs in achieving their core educational objectives. These objectives include enhancing digital competencies among faculty and students, advancing digital pedagogy, and establishing an integrated e-learning system that effectively utilizes educational technologies, provides real-time feedback and assessment, and ensures consistency and quality in digital course delivery within the institutional e-learning policy framework.

Education Informatization II emphasizes embedding technology as an integral element within education systems, not as an accessory, but as a means to enhance pedagogical objectives. It signifies a strategic shift from traditional top-down management approaches to a more inclusive governance model. Moreover, Education Informatization II seeks to bridge the gap between macro-level policy objectives and the practical realities of teaching and learning. It intends to address prior challenges where policies often failed to translate into meaningful improvements in the quality of education experienced by students, ensuring alignment between administrative goals and classroom needs.

After Education Informatization II have been released in 2018, five years later in the national statistic report examining campus-wide WIFI coverage, fundamental technical infrastructure, and e-learning systems such as learning management systems and student administration platforms in universities across China, 98% of universities have achieved campus-wide Wi-Fi coverage, and almost all universities have developed fundamental IT infrastructure (Smart Campus), the vast majority of universities have instituted e-learning systems, with nearly universal adoption of learning management systems and student administration platforms(The Information Technology Center of MOE, 2023). It is obvious to see vast majority of universities have met their goals in two objectives (Expansion of Networked Learning Spaces & Establishment of Smart Campus) Education Informatization II. Based on this, so Expansion of Networked Learning Spaces & Establishment of Smart Campus will be out of research scope in this study. In the meantime, a relatively small percentage of the sampled Chinese higher education institutions, merely 2.8%, incorporated virtual reality learning into their educational practices (The Information Technology Center of MOE, 2023). The incorporation of emerging technologies into teaching and learning has become an increasingly urgent component of a comprehensive institutional e-learning policy. Academic HEIs in China must focus not only on enhancing faculty digital literacy, pedagogical skills, and students' digital literacy but also on developing sophisticated e-learning systems that support teaching and learning. Additionally, they need to intensify efforts to adopt and integrate emerging technologies effectively.

### 2.8.2.2 Institutional e-learning policy

From the micro-level of e-learning policy, higher education institutions aim to allocate resources for specific goals, set operational plans and run e-learning practice smoothly (Czerniewicz & Brown, 2009). However, in China context, institutional e-learning policies must be strategically aligned with national educational goals while considering the specific needs and context of individual institutions. Effective policy should not view Education Informatization II as a peripheral initiative but rather as a central component of the institution's strategic vision. This alignment ensures efficient use of resources, promotes long-term sustainability, and fosters innovation in digital education (Huang & Dai, 2021; Cheng & Wang, 2017). Institutional e-learning policy should prioritize the integration of technology to enhance pedagogical practices, moving beyond the mere digitization of existing methods to a more transformative use of technology that drives educational outcomes. According to action plan of Education Informatization II and insights gained from the chapter of literature review, a detailed table is designed to identify key aspects and components of institutional e-learning policy for China academic HEIs (See table 2.6).

Table 2.6 Key Aspects of Institutional E-learning Policy

Key Aspects of institutional e-learning policy	Components of institutional e-learning policy
General Guidelines	General Guidelines
Vision & Mission	Vision & Mission
Ensure consistency and quality across e-learning course offerings	Certification Policies and Guidelines
	Guidelines for Course Design and Development
	Guidelines for Course Delivery System
	E-learning Course Evaluation
	Ownership of Intellectual Property

Engaging and supportive learning environment	Faculty Professional Development (digital literacy & pedagogical development)
	Student Support
	Feedback Mechanisms
Build awareness on internet security and ethical digital use	Data privacy & Security
Equitable access to learning resources across regions	Accessibility and Inclusion
Integration of Emerging Technologies in Intelligent Education	Emerging Technologies: Leverage AI for personalized learning experiences Use AR/VR for immersive learning experiences

Source: Author's own work

### 2.8.2.3 Human factors

Human factors involve specific variables that are grouped into faculty's and students' readiness for employing e-learning technologies in teaching and learning practices, which have a causal relation with the performance of adopting e-learning and have been identified as critical success factors by experimental studies (Boyatt, 2014; Selim, 2005; Soong, et al., 2001; Volery & Lord, 2000). In the model, faculty readiness (faculty's digital literacy and pedagogical skills) and students readiness (students' digital literacy) are key determinants which influence participants (faculty and students) enacting e-learning practice in teaching and learning. The effectiveness of how faculty and students perform e-learning practice is relied on the influence of other three predominant components.

The success of e-learning is deeply intertwined with the human elements involved. Both instructors and students are central to the e-learning process, with their characteristics such as motivation, adaptability, digital literacy, and engagement levels directly influencing the effectiveness of e-learning and with their responses to e-learning policy. Collaboration, defined as either between students in group projects

or between instructors and students in feedback sessions, is a cornerstone of e-learning. Effective collaboration can enhance understanding, foster a sense of community, and improve learning outcomes. Studies by King and Boyatt (2014), Volery and Lord (2000), Soong, et al. (2001), and Selim (2005) emphasize the paramount importance of these human aspects in determining the success of e-learning initiatives.

#### **2.8.2.4 Technical factors**

In many experimental and evaluative studies (Boyatt, 2014; Selim, 2005; Soong et al., 2001; Volery & Lord, 2000), technical factors are commonly classified into two core categories: information technology (IT) infrastructure and technical support services provided by universities. While the former concerns the physical and digital foundations enabling online education, the latter determines the extent to which users—faculty and students—can effectively engage with e-learning environments. In the context of Chinese HEIs, by 2023, most universities have achieved a baseline level of IT infrastructure development, including stable internet connectivity, LMA, and digital learning spaces (see Chapter II, Section 2.3.1). This study places conceptual emphasis on the second category—technical support—as the more decisive factor influencing the success and sustainability of e-learning initiatives.

Technical support encompasses a range of services designed to assist both instructors and students in navigating digital systems, troubleshooting problems, and developing

technological proficiency. These include IT help desks, training programs, online user guides, library assistance, and responsive maintenance teams. How these services operate directly influences what outcomes are achieved: effective support reduces user frustration, builds confidence, and fosters sustained engagement with e-learning systems (Igarria et al., 1997; Ngai et al., 2007; Selim, 2005; Venkatesh & Davis, 2000). Conversely, insufficient or poorly coordinated support can exacerbate anxiety, lower adoption rates, and diminish the perceived usefulness of digital tools.

Studies show that technical support does not merely serve an operational function but acts as a mediating mechanism that shapes attitudes toward e-learning. When faculty and students receive timely IT training and problem-solving assistance, they are more likely to perceive e-learning platforms as reliable, user-friendly, and aligned with pedagogical goals (Masrom, 2008). This perception, in turn, enhances technology acceptance and the willingness to integrate digital tools into teaching and learning practices. Thus, the effectiveness of technical support lies not only in what services are provided but also in how these services are delivered—whether they are continuous rather than episodic, adaptive to user needs rather than standardized, and embedded within an institutional culture that values teaching innovation.

#### **2.8.2.5 Financial factors**

Financial considerations underpin the sustainability and scalability of e-learning initiatives. Adequate funding ensures the availability of essential resources such as

software, content, and training. Furthermore, understanding running costs and ensuring cost-effectiveness is pivotal for the long-term viability of e-learning programs. Studies highlight the significance of financial aspects in the successful implementation and continuation of e-learning (Nicol & Coen, 2003; Sharma, 2011; Steinberg, 2004).

Three e-learning models of cost factors are demonstrated in Table 2.7. The cost-benefit model, established for supporting decision-making in universities, is conceptualized as a tool for cost-effectiveness analysis (Nicol & Coen, 2003). In this model, costs and benefits are both evaluated from institutional perspective for examining e-learning investment alternatives. Financial factors of the e-learning model, which help administrators control the quality of e-learning throughout teaching and learning, provide universities with guidelines that allocate resources for implementing e-learning (Sharma, 2011). In this system, various costs (ranging from variable costs, fixed costs, direct costs, to indirect costs) are classified and centered on three aspects: content, delivery, and service. The business model of e-learning, consisting of a cost structure of e-learning, emphasizes establishing a sophisticated e-learning approach that facilitates e-learning practice (Steinberg, 2004). This model explicitly depicts that the quality of academic content, program delivery, and student and instructor support service are three critical components that determine the level of students' outcomes of e-learning practice. Although Steinberg's business model of e-learning studies more components than cost factors of the e-learning model and

cost-benefit model do and the former one is more comprehensive than the other two, these three models all emphasize on initial investment, running costs, and cost-effectiveness of e-learning, making it clear that costs of digital content, delivery, and service, correlated with student-teacher interaction, are strongly associated with the performance of e-learning implementation at universities.

Table 2.7 Three theoretic models relevant to cost factors of e-learning

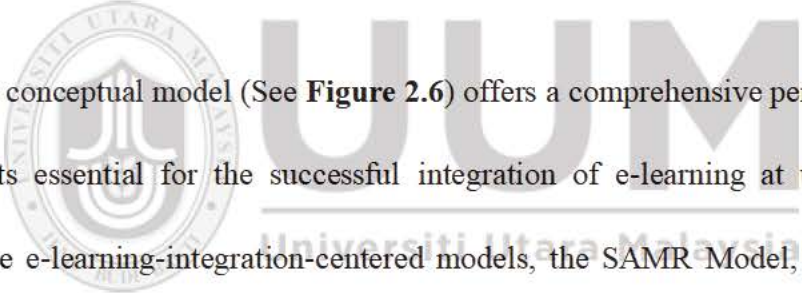
Name of the conceptual model of e-learning	Researcher(s) and year of publication	Main Focus
Cost-benefit model of e-learning	Nicol, D. & Coen, M. (2003)	Evaluating the costs and benefits of using ICT in higher education. Various Cost factors are specifically synthesized and deciphered as staff costs (related to staff salaries for delivering & teaching) , capital costs (relevant to updated course content and new technology), revenue costs (IT support and services), and overhead
Business model of e-learning	Steinberg, C. D. (2004)	Establishing a business e-learning model for decision-making: develop independent e-learning systems or use third-party e-learning system. Cost structure and factors are critically examined and then selected as : program delivery, academic quality, student support and service, instructor support and service, instructor incentive program
Cost factors of e-learning system	Sharma, K. (2011)	Assessing cost factors for e-learning success at conventional universities. Three cost factors are specifically demonstrated: content, service, and delivery

#### 2.8.2.6 Legitimacy of the Classification of CSFs in the Conceptual Model

The classification of CSFs into human, financial, and technical aspects offers a holistic perspective on the multifaceted elements that contribute to strengthening understanding of institutional e-learning policy and in turn, the success of implementing e-learning at universities. By categorizing these factors, stakeholders can prioritize and address specific areas based on their resources and objectives. Human aspects emphasize the central role of instructors and students, acknowledging that technology alone cannot ensure successful e-learning. The financial aspects highlight the importance of sustainable funding models, ensuring that e-learning initiatives are not just launched but are maintained over time. Lastly, technical aspects

focus on the user experience, ensuring that the platforms are not only functional but also user-friendly and of high quality.

This classification is legitimate as it aligns with the broader literature on project management and organizational success, where human, financial, and technical factors are highlighted as essential factors (Adzmi & Hassan, 2018; Bilan, et al., 2020; Gunduz & Almuajebh, 2020; Hu & Raman, 2024; Vrchota, et al., 2020). By understanding and optimizing each category, HEIs can enhance the effectiveness of institutional e-learning policies and reach of their e-learning initiatives.



Further, the conceptual model (See **Figure 2.6**) offers a comprehensive perspective on the elements essential for the successful integration of e-learning at universities. Unlike three e-learning-integration-centered models, the SAMR Model, E-Learning Maturity Model, and TPACK Framework, the model provides a holistic view that encompasses financial considerations, human-centric metrics, and technical support. This breadth ensures that administrators consider all potential areas of impact, from sustainable funding models to user experience and quality assurance. The emphasis on human aspects ensures policies are designed with instructors and students at the forefront, addressing their collaborative efforts and unique characteristics. Furthermore, the model's adaptability allows them to suit the diverse needs of different HEIs, providing clear benchmarks for long-term success. The SAMR Model concentrates on how technology integrates into teaching methods, the e-learning

Maturity Model assesses an organization's readiness for e-learning, and the TPACK Framework explores the relationship between technology, teaching methods, and subject knowledge. In contrast, the model offers a comprehensive approach, addressing a wide array of factors to ensure that e-learning policies are sophisticated, sustainable, and tailored to universities' specific needs.

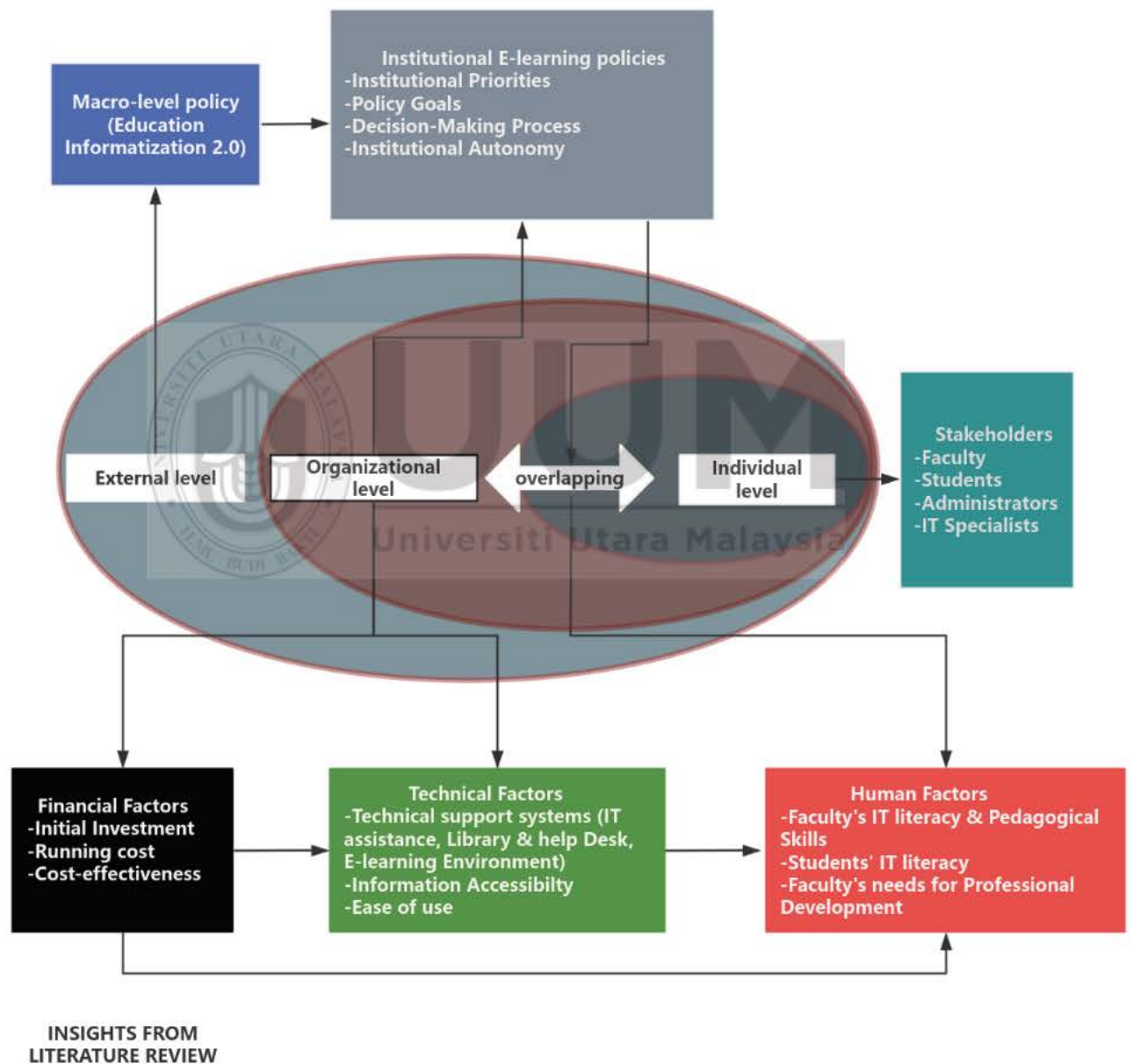


Figure 2.6 The Conceptual Framework of Institutional E-learning Policies  
Source: Author's own work

## **2.9 Fairclough's Framework of Critical Discourse Theory(CDA)**

CDA is a set of approaches that examines the relationship between language, power, and society. Drawing from linguistics, sociology, and political theory, CDA explores how discourse reflects and shapes social realities (Fairclough, 2013). Scholars such as Norman Fairclough, Ruth Wodak, and van Dijk have significantly shaped the development of CDA, which offers insights into the power dynamics embedded within institutional discourse (Wodak & Meyer, 2009). At its core, CDA challenges the notion that language is neutral, instead emphasizing that discourse is inherently a form of social practice (Fairclough, 2013). In this study, CDA functioned as an analytical framework to grasp the assumptions on the role of e-learning in higher education that inform institutional e-learning policies, and to explore how the language used in these policies uncover how power dynamics, ideologies, and social practices are embedded, thereby providing insights to understand the essence of institutional e-learning policies.

A foundational focus of CDA is the social role of discourse, which extends beyond communication to actively shape social structures and ideologies. According to van Dijk (2020), discourse constructs societal knowledge, assumptions, and power relations, reflecting the ideologies that dominate a particular social group or institution. This view is critical for analyzing institutional policies, as it helps researchers uncover how e-learning policies are shaped by larger social, political, and economic forces. CDA can reveal how policy discourses centred on the adoption of

e-learning in the context of Chinese higher education reflect broader ideologies, such as globalization and "soft power." The former often presents China's technological and educational growth as beneficial not only to its citizens but also to the world, positioning China as a key player in global education. The latter is a strategy to enhance China's international influence through education and technology. This transformation is often framed as a crucial step in China's modernization and its pursuit of greater global competitiveness.

CDA also provides a critical lens for examining how power is embedded in language. Van Dijk (2020) illustrates that language constructs social identities and boundaries, often reinforcing unequal power relations. CDA can reveal how certain groups—such as institutional committees, administrators, or educators—use discourse to shape educational practices, while excluding or marginalizing other voices, such as faculty members or students. This aligns with Fairclough's (2013) idea that language is a means of reinforcing or contesting existing social relations, which in the context of e-learning policy, might involve framing ICTs as a tool for democratizing education, while simultaneously reinforcing economic inequalities or institutional control.

The application of CDA in the study of e-learning policies in Chinese academic HEIs is particularly valuable for understanding the intersection of discourse and policy-making. By examining the language used in policy texts, CDA allows researchers to trace the ideological forces that shape the policies and their

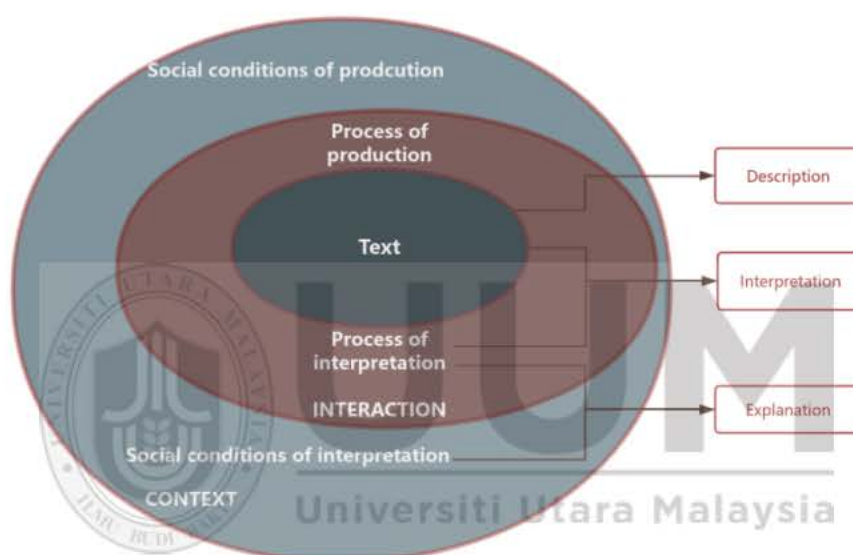
implementation. As Wodak and Meyer (2009) note, CDA is not only a tool for describing how power operates through discourse but also for explaining the broader social structures that inform these power dynamics. In the case of e-learning, CDA offers a way to explore how the discourse around technology, pedagogy, and access reflects societal priorities, such as improve learning outcomes and the emphasis on efficiency.

Fairclough's (1993) framework (See **Figure 2.7**) provides a comprehensive approach to CDA, emphasizing the relationship between discourse practices and broader social structures. This framework is particularly useful in understanding how e-learning policies are linked to the context of China's academic HEIs. Focusing on the relationships between policy discourse and the underlying social processes, CDA helps to reveal how e-learning policies reflect larger societal ideologies, including the promotion of e-learning in teaching and learning as a solution to perceived educational shortcomings. As such, CDA critically examines the role of ICTs in education and serves as not only a tool for enhancing teaching and learning but also an instrument that contributes to the consolidation of power within higher education institutions.

The purpose of CDA, therefore, is not merely to describe the content of policy texts, but to uncover the hidden power relations and ideological forces that shape them.

Fairclough (2013) asserts that CDA goes beyond textual analysis to explain how

discourse reflects broader social structures. In this study, CDA is applied to analyze the role of e-learning policies in China's academic HEIs, exploring how these policies are constructed, who benefits from them, and how they reflect or challenge existing power dynamics. By focusing on the discursive practices centred on the formulation and implementation of institutional e-learning policies, the study aims to uncover how power and ideology are embedded.



**Figure 2.7** Analytical Framework of CDA

Source: Adopted from Fairclough' Analytical Framework (1993)

This research analyzes e-learning policies through the lens of the CDA framework, which involves three interconnected stages of analysis: first, delineate the text; second, decipher the relationship between the text and interaction (discourse); and third, explain the connection between discourse and the broader social context. In this context, the e-learning policies are treated as textual artifacts. A text is an outcome, not a progression, resulting from the act of text production (Fairclough, 2001). For this study, text production is reframed as the formulation of policy. Discourse,

however, is understood as the entire interactional continuum, with the text representing only one component within it.

### **2.9.1 Delineation of the text**

The first part of Fairclough's Critical Discourse Analysis (CDA) framework (See table 2.8) examines the texture of the text, with its structure across grammar, lexicon, and argumentation. This approach is critical for policy analysis as it unveils how language shapes identities and social relations (Pinto, 2011). For e-learning policies, a close reading of the text—understood as the content itself—can expose the values, ideologies, and interests that policymakers aim to promote (Bell & Stevenson, 2006).

By analyzing linguistic choices, CDA reveals not only policymakers' explicit intentions but also the implicit ideologies within the text. The creation of a policy is a deliberate process, shaped by both conscious decisions and unconscious biases. Word choice, sentence structure, and discursive tactics are strategically employed to achieve specific political or social objectives. This reinforces the idea that language is not neutral but a tool for constructing social realities and power dynamics. Thus, CDA is pivotal in understanding that e-learning policies are not just technical tools, but are deeply influenced by ideological and institutional contexts. This study analyzes four key aspects of the text, as outlined by Fairclough (2001), to uncover the discursive mechanisms in e-learning policy development.

Table 2.8 Four key aspects of Fairclough's framework

Key aspect of Text	Functions	Examples
Whole Text Organization	This refers to the overall structure of the policy, including its narrative and argumentative components.	Is the policy linear or more complex, aiming to persuade or inform the reader? Analyzing whether the policy adopts a prescriptive, descriptive, or normative genre helps to identify its tone and intent.
Clause Combination	Examining how ideas are linked in the text reveals relationships between propositions.	Understand how the policy constructs causal links, conditions, and consequences
Grammatical and Semantic Features	Key elements like transitivity, action, voice, mood, and modality highlight how agency and power are represented	Terms like "must," "should," or "may" reveals the degree of obligation or possibility assigned to actors such as faculty, students, or administrators.
Vocabulary and Lexical Choices	The wording, collocations, and metaphors used in the policy reflect the underlying ideology.	"Innovation", "Modernization" or "Education Informatization" may frame e-learning as a progressive endeavor, while "cost-efficiency" might reflect an economic focus. The use of metaphors, such as "bridging the digital divide", shapes the perception of e-learning, presenting it as either a solution or a challenge.

Source: Adapted from Fairclough' framework (2001)

Firstly, text analysis is essential for understanding how institutional e-learning policies, as a whole, are organized by evaluating its genre and the discursive types. To comprehend its structure, it is essential to investigate its genre, as this illuminates the rules governing the composition of policy documents within universities. According to Bhatia (2002), genre analysis enhances our understanding of how members of specific discourse communities construct, interpret, and employ these genres to fulfill their community goals. In the context of e-learning policies, such an analysis helps explain the conventions that shape how these policies are written and communicated. Thompson (2005) categorizes different text genres and the corresponding discursive types that emerge from them. This categorization is pivotal for understanding the linguistic strategies employed in policy texts. In three discourse studies of policy

analysis, genre types and discursive types are specifically adopted to investigate the nature of e-learning policy (Chikuni, 2017; Rambe, 2012). As illustrated in Table 2.9, each genre corresponds to specific discursive types that shape how the policies inform stakeholders.

Table 2.9 Outlines of Discursive Types & Test Genres

DTs & TGs	Specific Term	Definition
Discursive Types (DTs)	1. Technocracy	It refers to the technocratic discourse, which emphasizes technological solutions and positions technology as central to solving educational challenges. It conveys a belief in technology as a means to modernize or streamline educational processes.
	2. Legitimacy	This asserts disciplinary authority by reinforcing established norms and practices within the institution. It suggests that e-learning policies are backed by academic legitimacy and professional standards.
	3. Neutrality	It reflects a balanced approach, where the policy maintains an impartial stance on the advantages or challenges of e-learning. It avoids taking a strong position, possibly aiming to appeal to a broad audience without alienating any group.
	4. Corporatism	Reflecting a mutual partnership, this type emphasizes the collaborative nature of e-learning, suggesting that its success relies on the cooperation of various institutional stakeholders, including faculty, administration, and external partners.
	5. Technological optimism	It underscores a positive outlook on technology, highlighting its potential to enhance academic engagement and learning outcomes. It focuses on optimistic narratives about the transformative effects of technology in education.
	6. Pragmatism	It is centered on finding realistic, practical solutions to challenges. In e-learning policies, it may be used to present technology as a pragmatic response to limitations such as resource constraints or the need for greater educational access.
Text Genres (TGs)	1. Confidence	It conveys a sense of trust or assurance between the author and the audience. It indicates that the policy is meant to be confided in as a reliable source of guidance for implementation.
	2. Factual information	It presents information in an objective, undisputed manner. It is structured to convey that certain facts are accepted as truths, often aimed at fostering credibility and authority.
	3. Humour	Humour in policy texts, although rare, can be used to lighten the tone or make the content more engaging, though it risks diminishing the seriousness of the policy.
	4. Persuasion	It involves using language to urge or coerce action. It is designed to influence the reader's mindset or encourage specific behavioural changes regarding e-learning adoption or implementation.

Source: Adopted from Chikuni (2017)

TGs and DTs reflect the processes of text production and interpretation, revealing patterns of action and interaction within specific social contexts (Fairclough, 2003).

While identifying TGs and DTs in policy texts is somewhat subjective, examining the conditions under which these texts are produced and understood provides valuable insights into the social practices of the policy-making community (Chikuni, 2017). Analyzing discourse at the micro level uncovers how social power is constructed and exercised within institutional contexts (Rambe, 2012). Using tables in this analysis demonstrates the power of Critical Discourse Analysis (CDA) in exploring how language in e-learning policies can privilege certain discourses while marginalizing others (Chikuni, 2017).

The second aspect of analysis in this study provide an in-depth study of the grammatical and semantic features of the policy text. To scrutinize the grammar of such texts, Fairclough (1989) suggests posing key questions: What types of processes and participants predominate? Is agency ambiguous? Are the processes portrayed in their true form? Are the sentences structured in active or passive voice, and do they convey positive or negative meanings? Understanding these grammatical and semantic nuances is crucial for this thesis, as policies often encapsulate underlying values. Fairclough (1989) also argues that when analyzing language, one must examine the experiential, relational, and expressive values embedded in words, asking whether certain terms are ideologically contested or exhibit rewording or over-wording.

Thirdly, this analysis also considers the use of metaphors in the policy discourse. Pinto, (2011) states that the frequent employment of emphatic language, laden with adjectives, is typical of political discourse, as it aims to assert political convictions and a strong commitment to certain ideas or causes. The scholar observes that metaphors, while highly persuasive, can also be restrictive, potentially obstructing a comprehensive understanding of the issue at hand (Morgan, 1997). When this occurs, the metaphorical framing can narrow the legitimate boundaries of policy debate, thereby limiting the scope of critical discussion.

### **2.9.2 Interpretation of discursive practice**

The second stage of Fairclough's model (See **Figure 2.7**) explores the connection between the policy text and the interaction that contributed to its creation (policy formulation). CDA recognizes the discursive, semiotic, and linguistic dimensions inherent in policy, policy-making, and analysis (Fairclough, 2012). From the CDA perspective, policy-making is viewed as a discursive arena where language and discourse play a pivotal role in shaping policy options. According to Jørgensen and Phillips (2002), discursive practices, or the processes through which policies are produced, are profoundly influenced by power dynamics. This thesis explores how these power relations shape the formulation of e-learning policies, examining how the personal ideologies of stakeholders regarding the role of ICT in teaching and learning are embedded within these policies.

### **2.9.3 Explanation of social practice**

The final stage of Fairclough's model elaborates the relationship between interaction and its social context, accentuating that the analysis of social practices must encompass three crucial dimensions of the socio-cultural context in which a communicative event transpires: economic, political (including power and ideology), and cultural values (Fairclough, 1995). In a similar vein, Bell and Stevenson (2006) shape the context of education policy as the antecedent conditions and pressures that engine the development of specific policies, underscoring the necessity of analyzing the economic, social, and political factors influencing the emergence of issues on the policy agenda. Moreover, understanding the context requires examining how a policy connects to prior policy experiences and whether it builds on or diverges from them. E-learning, as a form of social practice within universities, is not isolated but intricately linked to the historical and contextual use of ICTs in teaching and learning. The social actors involved in crafting e-learning policies rely not only on personal experiences and strategies but also on collective frameworks of perception, or social representations, which encompass concepts, opinions, attitudes, evaluations, and images shaped by daily life and reinforced through discourse within a community.

### **2.9.4 Further details of CDA for analyzing**

There is no one-size-fit-for-all method for conducting CDA of policy, nor is there a fixed approach for gathering data. In CDA analysis, data collection is not placed as a necessary step to be completed prior to analysis; rather, following the initial data

gathering, the first stage of analysis is conducted. This leads to identifying indicators for specific concepts, expanding these concepts into broader categories, and, according to these insights, collecting extra data through a process known as theoretical sampling. In this approach, data collection is an ongoing process, with new questions emerging that can only be addressed by either collecting fresh data or revisiting the existing data (Fairclough, 1995). CDA examines texts and interactions, but it does not begin with them. Instead, it originates from the social issues and challenges people encounter in their daily lives. CDA analyzes these issues through analyzing their semiotic dimensions.

To follow Fairclough's proposal, the study focuses on a specific social problem that has a semiotic dimension, extending the analysis beyond the text itself to describe the problem and pinpoint its semiotic elements. Second, identifying the dominant styles, genres, and discourses that shape this semiotic aspect. Third, considering the variation and diversity in these styles, genres, and discourses. Finally, identifying any resistance to the top-down control exerted by the dominant styles, genres, and discourses.

### **2.9.5 Critiques on Fairclough's Framework**

Although Fairclough's method is insightful and bring many clarity to understanding discourse of institutional e-learning policies, it is not without limitations (Haque, 2008). Some challenges or potential risks that institutional e-learning policies do not

address are silent in the policy text of some HEIs. This does not mean that universities do not take any initiatives to address these challenges or risks (Chouliaraki & Fairclough, 2010). Therefore, to help overcome these limitations, the author will use Stakeholder theory and Activity theory to further an understanding of stakeholders' views of whether absence of potential risks in discourses of institutional e-learning policies are actual challenges, as stakeholder theory can help detect whose interests are prioritized or excluded from policy formulation and Activity theory aid discover systemic contradictions and tensions between policy intentions and institutional practices. Collectively, these analytical frameworks validate whether the silences in policy discourse are actual challenges at Chinese academic HEIs, and explore how these silences influence stakeholders' experiences while adopting e-learning.

### **2.10 Stakeholder Theory**

Stakeholder theory is used to provide a structured approach to identify, engage, and prioritizing stakeholders (students, faculty, administrators, and IT specialists) at academic HEIs, and to analyze how stakeholders' needs are acknowledged and incorporated into existing institutional e-learning policy at academic HEIs. Stakeholder theory centers on the relationship between institutions (academic HEIs) and stakeholders. In this study, stakeholder theory is used to help:

- *Identify whether stakeholder needs and expectations are met or not*
- *Identify whether collaboration and engagement exist among stakeholders*

- *Identify whether absence of potential risks missed in discourses of institutional e-learning policies are actual challenges*
- *Identify whether current institutional e-learning policy encouraged iterative feed back loops, facilitating continuous improvement*

Stakeholder theory, originated in the field of business management, offers a framework to examine the interplay between organizations and their various constituents. The fundamental theory was introduced by Freeman in *Strategic Management: A Stakeholder Approach* (1984), where stakeholders were defined as any individuals or groups capable of influencing or being influenced by an organization's objectives. Freeman highlighted the mutual dependence between organizations and their stakeholders, underscoring the need for collaboration and consideration of diverse interests. This perspective was later expanded by Carroll in 1996, who described stakeholders more inclusively as those impacted by an organization's actions, policies, or goals, thereby encompassing both direct and indirect relationships. This broader interpretation reinforced the idea that organizations must navigate complex networks of influence and accountability in their decision-making processes. Donaldson and Preston (1995) further developed stakeholder theory with descriptive, instrumental, and normative perspectives, balancing practical and ethical dimensions. Mitchell, Agle, and Wood (1997) highlighted its applicability beyond business, including education and public policy, with scholars like Bryson (2004) and Parmar et al. (2010) demonstrating its utility in

addressing competing stakeholder interests. However, critics argue that its broad definition complicates prioritization (Jensen, 2002) and that it lacks mechanisms for resolving stakeholder conflicts (Phillips, Freeman, & Wicks, 2003). Despite these challenges, stakeholder theory remains a vital framework for analyzing institutional dynamics, emphasizing inclusivity and collaboration.

### **2.10.1 Identifying stakeholders in institutional policy-making**

Stakeholder theory stresses the importance of identifying stakeholders and prioritizing them while prompting an in-depth understanding of whether the players possess a direct influence in policy-making process in China academic HEIs. The goal of the stakeholder analysis in this dissertation is to gain a holistic understanding of their interests and influences and how they involved in policy-making process.

It is very critical to identify stakeholders and prioritize them in policy-making process (See **Figure 2.8**), which can help universities understand which groups are marginalized, and whether adopting top-down, middle-out, or bottom-up approach for policy-making could harness the power of e-learning technologies in teaching and learning. In higher education context, to categorize stakeholders can sort out variance in multi-levels of interest and influence among various segments (Freeman, 1984; Brugha & Varvasovszky, 2000). Mendelow (1991) builds a analytical framework, categorizing stakeholders into four groups based on two indexes. First one is power, which means that stakeholders' abilities to influence decisions. Second one is interest,

which means their concerns about the policy (Mendelow, 1991; Johnson, Scholes, & Whittington, 2011). Four groups are key players, context setters, subjects, and crowds. Key players, who should be actively engaged in policy-making because this group have a strong interest in the results of the policy (Freeman, 1984; Taylor, 2013), and the authority to shape the decisions, are high-power, high-interest stakeholders. Context setters, the group should be keep satisfied because they have great influence but little participation in daily operations of the policy, are high-power, low-interest stakeholders (Jongbloed, Enders, & Salerno, 2008; Reed et al., 2009). Subjects, who should be keep informed because they lack the decision-making authority but can provide invaluable insights and grassroots support, are low-power, high-interest stakeholders (Brugha & Varvasovszky, 2000; Neville, Bell, & Whitwell, 2011). Crowds, who should be occasionally keep posted because they do not require engagement, are low-power, low-interest stakeholders (Ackermann & Eden, 2011; Bryson, 2004).

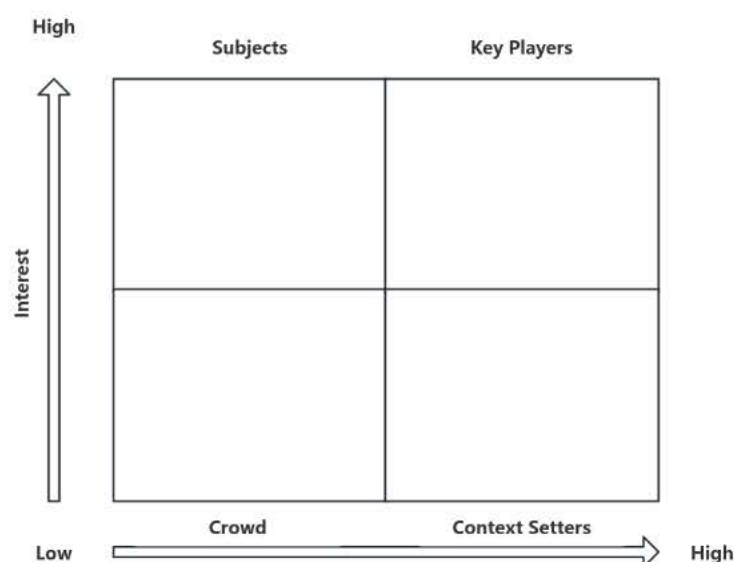


Figure 2.8 Stakeholder Map

Source: Adapted from Mendelow (1991)'s Stakeholder Matrix

Balancing the needs of IT specialists, administrators, faculty, and students, this model is particularly fit in higher education context (Jongbloed, Enders, & Salerno, 2008; Taylor, 2013). Mendelow's model, with its clarity and easy-to-understand structure, will be applied for stakeholder analysis in this context.

### **2.10.2 Stakeholder engagement in institutional e-learning policy-making**

Stakeholder engagement in institutional e-learning policy-making highlights the interactive processes through which diverse actors collaborate to enhance educational outcomes. Rooted in organizational literature and stakeholder theory, this concept emphasizes the importance of involving stakeholders in key decisions and operational strategies (Freeman, 1984; Donaldson & Preston, 1995). Effective stakeholder engagement fosters dialogue, enabling stakeholders to articulate their needs, address challenges, and align their contributions toward common objectives. In the context of e-learning, such engagement ensures that systems are not only technically robust but also pedagogically sound and user-centric. By creating platforms for collaboration and feedback, institutions can address underlying tensions, refine strategies, and cultivate a shared sense of ownership among students, faculty, IT staff, and administrators.

Stakeholder engagement in institutional policy-making operates across multiple levels, each reflecting the degree of involvement and collaboration among stakeholders. The International Association for Public Participation (IAP2, 2007) provides a widely

recognized framework with four distinct levels: inform, consult, involve, and collaborate & empower (See **Figure 2.9**). These levels represent a continuum of engagement, starting from the basic dissemination of information to stakeholders (inform) and progressing toward active partnerships where stakeholders share decision-making authority (empower). The framework highlights the varying degrees of information exchange and interaction, underscoring how engagement evolves from passive receipt of information to dynamic, participatory processes, as shown in the figure. Within e-learning initiatives, applying this model ensures that students, faculty, IT staff, and administrators are meaningfully involved, fostering a shared understanding and commitment to achieving institutional objectives.

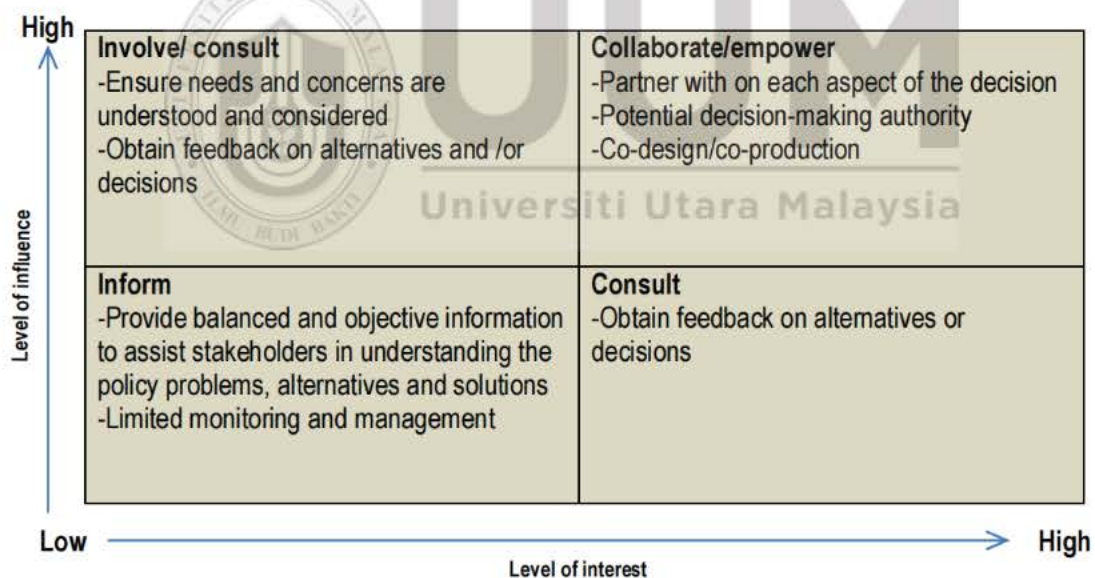


Figure 2.9 Continuum of Stakeholder Engagement  
 Source: Adopted from Victoria State Government (2011)

As depicted in the figure, apparently, the levels of informing and consultation represent the most basic forms of stakeholder engagement. It is clear to see stakeholders' interest and influence can be mapped onto a quadrant that determines the appropriate type of engagement for each group. Also, it is vital to know informing

involves simply providing stakeholders with information about policies through channels such as websites, newsletters, or public discussions (Arnstein, 1969). One study particularly indicates that consultation, while still limited in stakeholder influence, entails seeking input from stakeholders through surveys, interviews, or public commentary on draft policies (Rowe & Frewer, 2000). This approach, thereby, allows universities to gather diverse perspectives during the problem-identification phase, enabling a more comprehensive understanding of the issues that policies aim to address. It is also critical to know that involving stakeholders takes engagement further by ensuring their concerns and aspirations are actively considered throughout the process, fostering collaboration (IAP2, 2007). Not surprisingly, empowerment represents the highest level of engagement, granting stakeholders full responsibility for decision-making, such as when institutions commit to implementing policies as determined collectively by e-learning stakeholders.

In one particular empirical study, Pedersen (2006) examined stakeholder engagement in dialogue processes and developed a framework (See table 2.10) to assess the varying levels of interaction between organizations and their stakeholders. This framework, precisely, categorizes engagement from highly interactive to minimally engaging, helping to evaluate how effectively organizations involve stakeholders in their decision-making processes. It is obvious to see the categorization is illustrated in the table provided, which shows varying degrees of stakeholder involvement.

Table 2.10 Stakeholder Engagement Framework

	Low	High
Inclusion	Only a small group of stakeholders hold a privileged position	All pertinent stakeholders are involved in the dialogue
Openness	The dialogue is organized around a specific set of predetermined questions, problems, or issues	Dialogue is structured around open questions/problems/issues
Tolerance	One position has priority over all the others	New alternative and critical voices are respected
Empowerment	One stakeholder dominates the dialogue and decisions	Freedom and equality in dialogues and decisions
Transparency	no access to information regarding the process or outcomes of the stakeholder dialogue	Full access to information about the process and outcomes of the stakeholder dialogue.

Source: Adopted from Pedersen (2006)

Connecting with above, the analytical framework for institutional dialogue with stakeholders distinguishes between inclusive and hierarchical approaches. Also it is vital dialogues should remain open, allowing for diverse issues and perspectives to be raised, ensuring that all stakeholders' views are heard. Nonetheless, A vital argument is that when certain rationales dominate, it may inadvertently favor stakeholders holding those positions, thus impeding the inclusiveness of the process. It is a necessity engagement in dialogue must be comprehensive and well-balanced, involving all relevant parties to achieve meaningful stakeholder involvement and decision-making outcomes. Also, effective dialogue requires openness to diverse opinions, contributing to achieving policy goals (O'Faircheallaigh, 2017; Snyman et al., 2020).

### 2.11 Activity Theory

In this research context, Activity Theory, as an analytical framework, is used to explore the complexity of e-learning policy in China academic HEIs by framing the interactions among stakeholders, institutional support from an integrative perspective

(financial, human, and technical), and institutional e-learning policies. On the one hand, it emphasize the dynamic, systematic nature of e-learning, where multiple factors-policy, human, financial, and technical support-interact to shape the educational experiences. On other hand, Activity Theory provides a systemic lens to investigate the dynamic interplay between components in institutional e-learning policy matrix. The purpose of using Activity Theory in this study is to help:

- *Assess whether institutional e-learning policies support the acquisition, customization, and effective integration of e-learning tools*
- *Identify tensions and mismatched expectations among stakeholders*
- *Explore contradiction arise between components of the activity system*
- *Explore the intended and unintended consequences of institutional e-learning policy*
- *Investigate whether contradictions and tensions are unintended consequences, which are silent in institutional e-learning policies*

### **2.11.1 The Legitimacy of applying Activity Theory in this study**

It is clear to see that Activity Theory (AT) has become a significant framework (See **Figure 2.10**) for understanding human activity in social contexts, particularly in relation to learning and development. In addition, three key concepts in Activity Theory warrant critical examination: the core concept of activity, the inseparability of activity and learning, and the evolution of Activity Theory through different generations. It is vital these ideas play a crucial role in shaping how Activity Theory

is applied to fields such as education, institutional studies, and human-computer interaction.

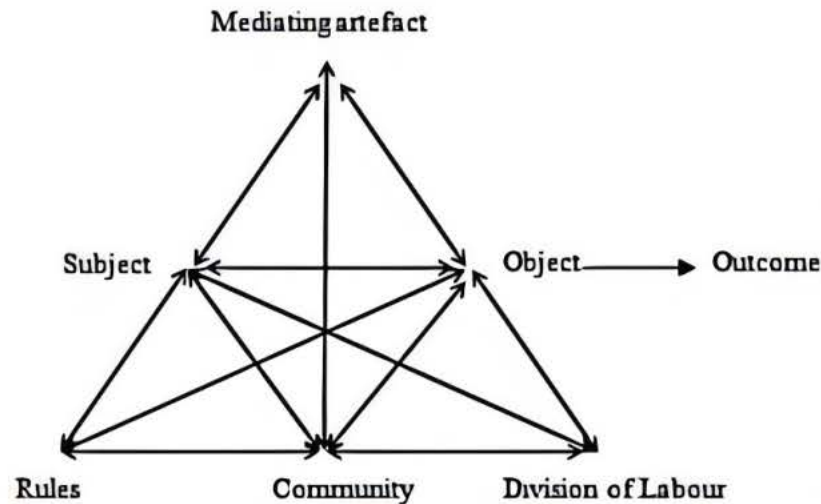


Figure 2.10 Activity Theory Model

Source: Adopted from Engeström's Activity theory model (1987)

First, the core concept of "activity" in Activity Theory, while central, has been critiqued for its minimal meaningful context for individual actions. Also, it is critical that the notion of activity as a system in which individuals are engaged with goals through the use of tools and social practices provides a broad, theoretical framework. Critics, however, argue that this can overlook the subjective and contextual nuances of individual actions. This is evidenced by two studies that while Leontiev (1978) and Engeström (1987) emphasize activity as the fundamental unit of analysis, the abstraction of "activity" sometimes lacks specificity when applied to individual learning or workplace behavior. Individual actions, which may not always align with collective goals, can be overlooked when activity is treated solely as a collective phenomenon. For example, in e-learning contexts, individual student interactions with online tools may be seen as part of a larger activity system, but this can diminish the

personal and cognitive dimensions of learning that are integral to the learner's experience (Holzman, 2009).

Second, Activity Theory views learning as inseparable from activity, arguing that human cognition and learning are always mediated by tools within a cultural-historical context. This perspective is foundational in Vygotsky's work, which stresses the role of social interaction and tools in shaping cognitive development (Vygotsky, 1978). However, this approach has been critiqued for sometimes overemphasizing the role of external tools and social mediation at the expense of internal cognitive processes. While tools and social interaction are undeniably important, the complexity of individual cognitive processes and the ways in which they interact with external tools may not be fully accounted for. In the context of e-learning, for instance, the emphasis on technology as a mediating tool in learning systems must be balanced with an understanding of how learners' internalized knowledge, motivations, and prior experiences shape their engagement with digital environments. Critics argue that AT may overlook the individuality of learning, reducing it to a purely social and cultural phenomenon (Cole, 1996).

Lastly, Activity Theory has evolved through different generations, with significant contributions from Vygotsky, Leontiev, and Engeström. Initially, Vygotsky laid the foundation for understanding activity as socially mediated, focusing on the interrelations between cognition, culture, and tools (Vygotsky, 1978). Leontiev

expanded on this by conceptualizing activity as a system with a hierarchy of levels (activities, actions, and operations), emphasizing the role of object-oriented activity in human development (Leontiev, 1978). Engeström's third-generation model introduced the concept of expansive learning and the idea that contradictions within activity systems can drive change and innovation (Engeström, 1987).

### **2.11.2 Activity Theory used as a analytical framework**

Engeström's third-generation Activity Theory (AT) model (See Figure 2.10) offers a valuable framework for analyzing the dynamic interactions among policy, financial, technical and human factors, particularly in complex higher education institutional settings. The model emphasizes expansive learning, a process where contradictions within the activity system, such as mismatches between policy goals and actual practices, drive innovation and new solutions. Engeström views contradictions not as obstacles but as catalysts for change, highlighting how tensions between stakeholders (e.g., administrators, faculty, students, IT specialists) and between policy, technology, and pedagogy can lead to the development of more effective practices. By examining e-learning through a systemic lens, Engeström's model integrates the roles of subjects, objects, tools, and community in a collaborative activity system, showing how interactions between these elements shape policy outcomes (See **Figure 2.11**).

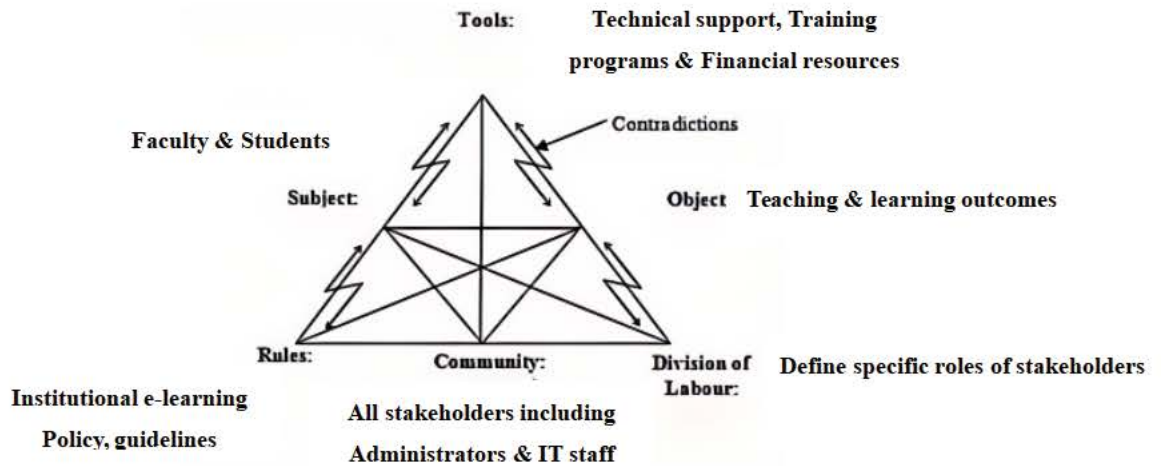


Figure 2.11 Activity Theory Model 3.0

Source: Adopted from Engeström' Activity Theory Model (1987)

According to the above figure, core components of Activity theory are illustrated as following:

- Subject: The individual or group engaged in the activity (e.g. faculty, students, IT specialist, administrators)
- Object: The purpose of the activity (e.g. Implementing and benefiting from institutional e-learning policy)
- Mediating tools: the instrument (technical, financial, and human factors) used to achieve the object
- Community: The social group or environment involved in the community (Institutional stakeholders)
- Rules: Formal and informal norms, policy and regulations (institutional e-learning policy and guidelines) governing the activity
- Division of labour: The distribution of tasks, responsibilities, and authority among participants (e.g. roles of IT specialists, faculty, and administrators)

- Outcome: the intended or unintended results of activity (e.g. improved learning outcomes or challenges in policy implementation)

In Activity Theory, the core components—Subject, Object, Mediating Tools, Community, Rules, Division of Labor, and Outcome—serve as the foundational elements for analyzing and interpreting complex educational systems like institutional e-learning policy matrix. For answering research questions, it is crucial to analyze how human, financial, and technical factors influence the activity system, particularly the interactions between stakeholders, resources, tools, and the outcomes of e-learning initiatives.

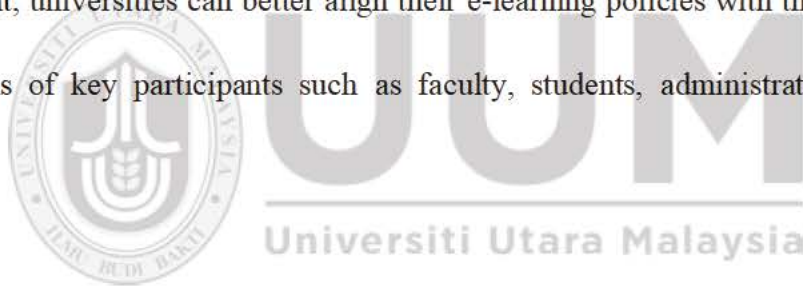
Building on the contradictions model of an activity system presented in Figure, an analytical framework has been developed to evaluate interactions among policy, technical, financial, and human factors associated with the incorporation of e-learning into learning and teaching, as shown in Table 2.11.

Table 2.11 Theoretical Component of Activity System

Theoretical components: Activity System	Research Components
Subject-Div of Labor-Object	Stakeholder roles and interaction
Subject-Rules-Object	Stakeholder conflicts and cooperation
Subject-Rules-Object	Impact of Faculty digital literacy and pedagogical skills
Subject-Rules-Object	Financial resources and tool acquisition
Subject-Rules/Tools-Object	Impact on policy implementation
Subject-Rules-Object	Budget conflicts and tensions
Subject-Rules-Object	Technical support and integration
Subject-Rules-Object	Tools and infrastructure
Subject-Community/Rules-Object	Community in technical support

Source: Adopted from Engeström' Activity Theory Model (1987)

Firstly, understanding stakeholder roles and interaction, and stakeholder conflicts and cooperation (See Table 2.12) are critical in aligning the interests of stakeholders and ensuring the effective use of technology and resources in achieving educational goals. The study, thereby, applied Stakeholder Theory to assess the degree of involvement and collaboration among stakeholders across academic HEIs, evaluating how effectively organizations include various groups in their decision-making processes. This approach allows universities to gather diverse perspectives during the problem-identification phase, fostering a more comprehensive understanding of the issues that policies aim to address. By examining the extent of stakeholder involvement, universities can better align their e-learning policies with the needs and expectations of key participants such as faculty, students, administrators, and IT specialists.

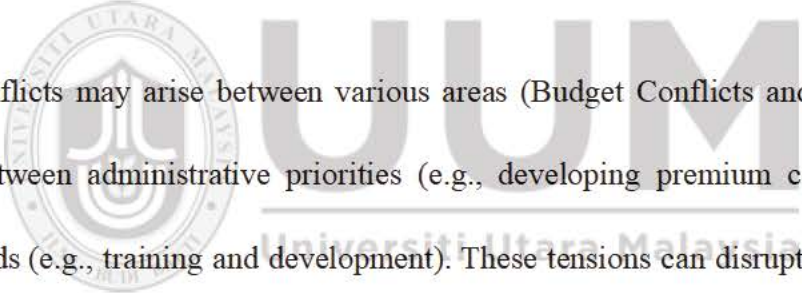


Building on this, Activity Theory is employed to identify matched or mismatched expectations among stakeholders (See Table 2.12), shedding light on tensions that may arise between stakeholders (e.g., administrators, faculty, students, IT specialists) and the policy, technology, and pedagogy. These mismatches can manifest as conflicts between faculty and administrators over resource allocation or between IT specialists and faculty regarding tool usability. By analyzing these tensions, Activity Theory helps to highlight the need for cooperation, where resolving conflicts or transforming them into productive collaboration can improve the execution of e-learning policies.

The faculty's digital literacy and pedagogical skills (See Table 2.12) are vital mediating tools in the activity system. They determine how effectively the tools are used to achieve the desired educational outcomes. If faculty lack the digital literacy or pedagogical training necessary to use e-learning tools effectively, the implementation of institutional policies can fail, despite the availability of technology and resources. This aligns with Activity Theory's focus on the subject-object relationship, where the subject (faculty) must be equipped with the appropriate tools (digital skills, pedagogical knowledge) to achieve the object (effective teaching outcomes).

Financial factors are another crucial sub-component that influences the activity system. These factors help shape the resources, tools, and rules that govern e-learning policy implementation. Financial resources are critical to support the acquisition of necessary tools (See Table 2.12), technologies, and infrastructure (Financial Resources and Tool Acquisition). With inadequate funding, institutions cannot provide the required platforms, software, or hardware needed to support effective e-learning environments. Financial resources are the mediating tools that enable the object (successful e-learning implementation) to be achieved. Activity Theory suggests that the availability of these resources (tools) directly impacts the subject's ability to fulfill their role. For instance, if faculty do not have access to the appropriate technological tools or platforms due to financial constraints, it becomes challenging to meet the e-learning objectives.

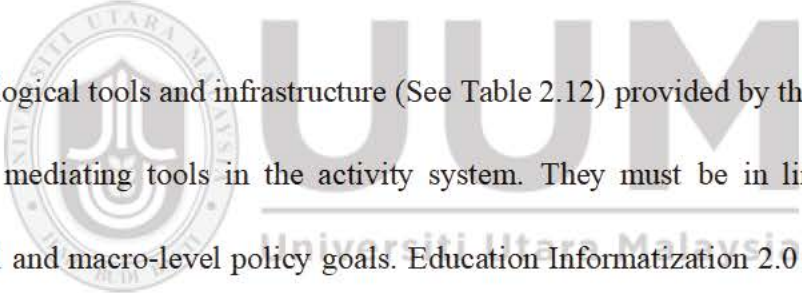
The financial allocation and distribution of resources determine how well e-learning policies can be implemented (Impact on Policy Implementation). If budget decisions (See Table 2.12) are misaligned with the objectives of the e-learning policy (such as not allocating enough for faculty training or technical support), this will hinder the activity system's ability to achieve its intended outcomes (such as improved learning outcomes). Activity Theory highlights the rules in the system, and financial policies are a part of those rules. When financial resources do not align with policy goals, contradictions emerge in the activity system that need to be resolved to ensure effective policy implementation.



Budget conflicts may arise between various areas (Budget Conflicts and Tensions), such as between administrative priorities (e.g., developing premium courses) and faculty needs (e.g., training and development). These tensions can disrupt the smooth functioning of the activity system. Activity Theory is effective for analyzing how these tensions affect the distribution of resources and tasks and how they influence the relationship between stakeholders (community). Addressing these financial tensions is essential to achieving the desired outcomes, particularly when aligning institutional policies with national frameworks like Education Informatization 2.0, which require specific financial investments in digital infrastructure and training.

Technical Factors (See Table 2.12) are fundamental mediators in the activity system, influencing the tools, infrastructure, and support available for e-learning. The

technical support system—including IT staff, help desks, troubleshooting, and maintenance—is crucial to ensuring that the tools (LMS, smart classrooms, software) are functional and effective. Without robust technical support, users (faculty and students) may face difficulties in using the e-learning tools, which can lead to frustration and disengagement. Activity Theory helps to analyze how mediating tools (technological resources) interact with the subject (faculty/students) and whether these tools are facilitating or hindering the achievement of the object (effective e-learning outcomes). When technical support is inadequate, contradictions arise, which need to be addressed for the system to function smoothly.



The technological tools and infrastructure (See Table 2.12) provided by the institution are central mediating tools in the activity system. They must be in line with the institutional and macro-level policy goals. Education Informatization 2.0 emphasizes the integration of ICT in education, which means institutions must invest in and support the appropriate infrastructure for e-learning. Activity Theory's focus on rules helps to highlight how the technical tools are governed by institutional policies and how those tools are used to achieve the broader goals of e-learning. If the tools do not meet the pedagogical needs or technological requirements of faculty and students, the system will fail to meet the intended outcomes.

Community dynamics in technical support (See Table 2.12) refer to how IT specialists, faculty, and students work together to troubleshoot and resolve technical issues.

Effective collaboration among institutional stakeholders are crucial to maintaining a stable e-learning environment. If communication between the technical support team and other stakeholders is poor, issues may not be addressed efficiently, hindering the success of e-learning policies. Activity Theory emphasizes the importance of community in the activity system, as the collaboration between technical support and users (faculty and students) helps ensure the successful integration of tools and resources. When technical support is well-coordinated with the community, it enhances the chances of achieving the desired outcome (successful implementation of e-learning policies).

Table 2.12 Sub-Activity Triangle

Sub-Activity Triangle focused on	Main RQs	Research components and related questions generated from main research questions (RQs)
Subject-Div of Labor-Object	Q1	Stakeholder roles and interaction: How do faculty, IT staff, students, and administrators (subject) interact within the e-learning system (tool), understand their respective roles (object) while adopting e-learning ?
Subject-Rules-Object	Q1	Stakeholder conflicts and cooperation: how do tensions, such as mismatched expectations between faculty (as users) and administrators (as decision-makers), influence the implementation of e-learning policies? The object is the desired outcome of the e-learning initiatives, which is to improve teaching and learning outcomes.
Subject-Rules-Object	Q1&4	Impact of Faculty digital literacy and pedagogical skills: how do institutional e-learning policies (rules) shape or fail to address faculty(subject) needs for training and development (object)?
Subject-Rules-Object	Q3	Financial resources and tool acquisition: how administrators (subject) make financial decisions such as budgeting for e-learning tools, align with the goals of e-learning policies (rules) and institutional needs (object)? Financial resources and technology maintenance and updates: how administrators (subject) make financial decisions such as budgeting for technology maintenance and update, align with the goals of e-learning policies (rules) and institutional needs (object)?
Subject-Rules/Tools-Object	Q3	Impact on policy implementation: how financial constraints (e.g., insufficient funds for training, and technology integration) affect the successful integration of e-learning technologies. Object (Effective use of e-learning technologies; Improved digital literacy among faculty; Efficient use of digital tools that support student engagement and learning outcomes), Subject (Administrators, Faculty, IT Staff) and Rules (Financial Policies), Rules (Financial Constraints) and Object (Successful Integration of E-learning Technologies);
Subject-Rules-Object	Q3	Budget conflicts and tensions: how do contradictions arise between the financial resources allocated by administrators and the needs of faculty (subject) and IT specialists (subject) for adequate tools and support (object)? The financial policies and budgetary allocations made by administrators

		(object).
Subject-Rules-Object	Q5	Technical support and technology integration: how well do e-learning policies (rules) address technical support for faculty and students (subject), and what challenges arise in terms of system integration (object)?
Subject-Rules-Object	Q1&3	Tools and infrastructure: whether policies (rules) mandate tools that are incompatible with legacy systems, and how this creates tensions in the system. The stakeholders involved(subject). The goal of effectively implementing e-learning initiatives to enhance teaching and learning(Object).
Subject-Community/Rules-Object	Q5	Community in technical support: how does the culture and community within the institution influence technical support systems (e.g., peer mentoring, IT training)? Subject (faculty, IT specialists)

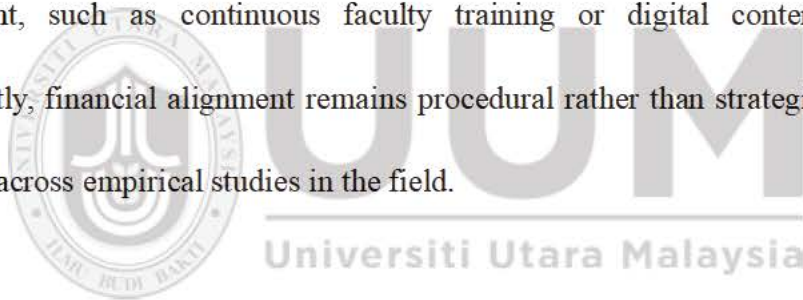
Source: Adopted from Engeström' Activity Theory Model (1987)

Existing literature has revealed that e-learning practice in Chinese academic HEIs is shaped by complex interactions across financial, human, and technical dimensions. Yet, alignment between institutional policy intentions and practical outcomes remains inconsistent. This inconsistency stems from how universities interpret national directives, prioritize resources, and negotiate institutional logics under Education Informatization 2.0 (MOE, 2018). The literature highlights that while the government promotes e-learning technologies as a driver of quality and innovation, institutional practices often prioritize compliance, expansion, or visibility rather than pedagogical integration (Huang & Dai, 2021; Li & Zhao, 2020).

From the financial perspective, institutional e-learning policies have been influenced by what can be termed an instrumentalist logic—the assumption that funding and policy incentives can directly drive technological modernization. National and provincial funding schemes typically reward measurable indicators such as IT infrastructure expansion, e-learning platform upgrades, or premium online courses. However, these mechanisms rarely guarantee the sustained pedagogical innovation that underpins meaningful integration of e-learning (Huang & Dai, 2021). As a result,

universities often pursue platform proliferation without embedding robust pedagogical support systems. This aligns with the broader critique that financial incentives reinforce compliance cultures—institutions focus on demonstrating alignment with policy mandates rather than internalizing digital transformation as an educational objective (Zhou & Xu, 2022).

The outcome is a paradox: policy compliance produces rapid IT infrastructure expansion, but this very expansion can entrench superficial adoption. Budget cycles, driven by short-term reporting, undermine investments in human capability development, such as continuous faculty training or digital content creation. Consequently, financial alignment remains procedural rather than strategic—an issue that recurs across empirical studies in the field.



The human dimension of e-learning implementation reveals further misalignment rooted in sociotechnical imbalance. Faculty development initiatives in many HEIs emphasize participation numbers rather than skill transfer or pedagogical transformation. As Zhang and Wang (2022) argue, e-learning training programs are often standardized and short-term, focusing on compliance rather than creativity. The result is a “participation paradox”: while faculty attendance in training sessions is high, actual pedagogical change remains minimal.

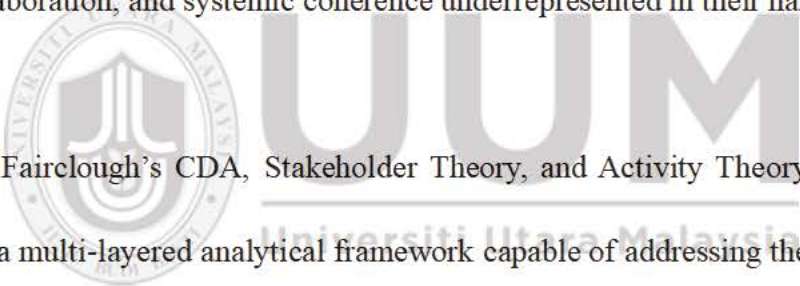
This reflects what sociotechnical theory identifies as a human-technology decoupling,

in which technological adoption outpaces the institutional capacity to integrate it meaningfully into teaching practice (Bostrom & Heinen, 1977). Faculty members often face role ambiguity—expected to innovate digitally while simultaneously constrained by rigid assessment criteria emphasizing research output (Wei & Gao, 2020). Consequently, the lack of alignment between policy rhetoric and professional realities generates resistance, workload fatigue, and pedagogical stagnation.

The technical dimension highlights a recurring pattern described in national evaluations as “hardware-rich, pedagogy-poor” (The Information Technology Center of MOE, 2021; 2023). Many HEIs have achieved impressive infrastructure development—smart learning platforms, virtual laboratories, and digital libraries—yet integration into classroom pedagogy remains partial. This reflects the tension between technological determinism and institutional contingency: while policymakers assume that technology inherently improves education, institutional cultures and pedagogical norms mediate its impact (Selwyn, 2016).

The challenge is, thus, not technological deficiency but systemic fragmentation: systems are rarely interoperable across departments, data analytic are underused, and e-learning environment lacks alignment with institutional teaching cultures. These limitations reinforce the need for a framework that connects financial, human, and technical perspectives within a single interpretive lens.

These three dimensions reveals a deeper structural misalignment across Chinese academic HEIs. Policies appear well-articulated in design but fragmented in execution because they are shaped by competing rationalities. Financially, compliance metrics dominate; humanly, pedagogical agency is limited; technically, infrastructure is prioritized over integration. These findings align with previous analyses of literature. This analytical synthesis underscores that misalignment is not an implementation failure per se, but a structural outcome of how policy discourses define success. Institutional e-learning policies are often discursively constructed around modernization, competitiveness, and global excellence—leaving pedagogical quality, human collaboration, and systemic coherence underrepresented in their narratives.



Integrating Fairclough's CDA, Stakeholder Theory, and Activity Theory, this study establishes a multi-layered analytical framework capable of addressing the discursive, relational, and systemic dimensions of institutional e-learning policies. CDA uncovers how policy language constructs legitimacy; Stakeholder Theory reveals whose interests those constructions serve; and Activity Theory exposes the systemic contradictions between policy intentions and institutional realities.

This theoretical triangulation reconciles fragmented insights in existing research. It explains why empirical findings vary across financial, human, and technical domains—because each dimension reflects different sources of misalignment: discursive omission, stakeholder exclusion, or systemic contradiction. It also clarifies

why policy interpretation varies across regions: institutional autonomy, local capacity, and stakeholder engagement collectively mediate how national directives are enacted.

Ultimately, this integrated approach justifies the need for a policy-centered, cross-dimensional conceptual framework—one that interprets e-learning policy not as static text but as a living assemblage of human agency, institutional structure, and technological mediation. In addition to this integrated approach, five conceptual propositions—derived from literature and logical reasoning—serve as analytical anchors for the study. These propositions provide tentative lenses for exploring the qualitative data, guiding the organization and interpretation of findings. Functioning as connective threads, they help link macro-level policy discourses with institutional responses and stakeholder perceptions, thereby structuring and enriching the analyses presented in Chapters 4 and 5. They are specifically listed as following:

- *The discursive construction of institutional e-learning policies reflects underlying ideological assumptions about modernization, efficiency, and digital transformation.*
- *E-learning policies in Chinese academic HEIs are shaped by national directives and local institutional priorities, creating tensions in alignment.*
- *The interpretation and enactment of e-learning policies depend on institutional capacities — financial, technical, and human — that vary significantly across academic HEIs.*

- *Stakeholders' understanding of institutional e-learning policies influences their engagement, support, and pedagogical practice.*
- *Systemic contradictions between policy discourse, institutional structures, and pedagogical practices mediate the effectiveness of e-learning in education.*

## **2.12 Summary**

The first part of this chapter consist of six critical components. Firstly, it underscores the inevitability of integrating e-learning into universities and the role of e-learning policies optimizing the integration. Secondly, it discusses the nature of macro-level and institutional e-learning policies, the interplay between macro-level and institutional e-learning policies, and related issues in Chinese universities. Then it critically analyze and discuss literature for exploring status quo of e-learning integrated in Chinese higher education. It also stresses the legitimacy and necessity of critical success factors , and grouping them into a integrated perspective. Finally, it also introduces literature about faculty and student attitudes toward institutional support mandated by institutional e-learning policies.

The second part of this chapter introduces a conceptual model developed by combining critical success factors identified in earlier research. This model categorizes these factors into three levels: Macro-level (Education Informatization 2.0), Organizational-level (institutional e-learning policy, along with financial, human, and technical factors), and Individual-level (institutional e-learning policy and human

factors). The model provides a clear framework to deeply understand institutional e-learning policy, addressing various factors to ensure that these policies are effective, sustainable, and aligned with the specific needs of stakeholders.

The third part of the chapter explores three key theories: CDA, Stakeholder Theory and Activity Theory, all of which are highly crucial to this study. CDA intends to analyze how institutional e-learning policies are conceptualized, the ideological assumptions they carry, and how they shape e-learning strategies. Stakeholder Theory offers a clear approach to identifying, engaging, and prioritizing stakeholders—such as students, faculty, administrators, and IT specialists—within academic HEIs. It also helps analyze how the needs of these stakeholders are incorporated into institutional e-learning policies, ensuring that policies align with the goals and concerns of all involved parties. Activity Theory provides a framework for understanding the interactions between policy, financial, technical, and human factors. It focuses on how these elements work together or conflict, offering insight into the complexities of e-learning policy and its impact on Chinese academic HEIs. This theory helps in understanding the broader dynamics at play when implementing e-learning.

At the end, this chapter establishes an integrative narrative that thematically organizes the literature (financial, human, and technical dimensions), explain why findings diverge, and justifies the need for a policy-centered, cross-dimensional frameworks.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The primary aim of this study is to not only study explore students' and faculty's perception of institutional support mandated by e-learning policy at China academic HEIs, but also evaluate how e-learning policy dictates financial, technical and human factors at these institutions. The researcher intends to address in-depth analysis on 'how' questions. The investigation method in this study is centered on documentary evidence, semi-structured interviews, and focus group interviews. The time horizon is cross-sectional, one time collection.

Unfolding the picture of e-learning implemented in teaching and learning at China academic HEIs and answer five research questions (Discussed in Chapter I), the author employs generic qualitative research method in educational settings, as it offers the flexibility and inclusivity necessary to explore the complex and multi-layered nature of e-learning policy design and implementation within Chinese academic HEIs. Unlike other qualitative methodologies that impose strict epistemological or procedural boundaries, the generic qualitative approach emphasizes the pragmatic fit between the research question and the chosen methods (Percy, et al., 2015). This flexibility allows researchers to draw on multiple theoretical and analytical traditions (Merriam, 2009)—CDA, Stakeholder Theory, and Activity Theory—to examine how Education Informatization 2.0 are interpreted, negotiated, and enacted at institutional

and individual levels.

While case study research is effective for providing in-depth analysis of a single bounded system, its contextual specificity may limit the generalizability of findings across multiple institutional types. In the present study, the phenomenon of e-learning policy misalignment transcends the boundaries of any single institution, encompassing diverse HEI contexts with varying financial, technical, and human capacities. Therefore, the case study's emphasis on institutional singularity would constrain the comparative and cross-contextual exploration needed to reveal systemic contradictions across policy levels.

Similarly, grounded theory—though powerful for theory generation—requires data collection and analysis to proceed without predetermined theoretical frameworks (Glaser & Strauss, 2017). However, this research intentionally integrates pre-existing conceptual lenses—notably Activity Theory and Stakeholder Theory—to investigate how structural tensions and stakeholder relationships shape the translation of policy into practice. This theoretical anchoring positions the study closer to a theory-informed exploration rather than an inductive theory-building endeavor, making grounded theory less appropriate.

In contrast, the generic qualitative approach accommodates the study's need to synthesize diverse data sources (e.g., policy documents, various stakeholders

interviews, and focus group interviews) while allowing the researcher to interpret findings through multiple analytical frameworks. This approach aligns with the study's central assumption that misalignment in e-learning implementation is not merely a failure of compliance or capacity, but a systemic contradiction generated by the interplay of discourse, institutional logic, and human agency.

Ultimately, the generic qualitative approach provides the methodological flexibility to connect macro-level policy discourses, meso-level institutional practices, and micro-level stakeholder experiences into a coherent analytical narrative. Its adaptability supports a nuanced, contextually grounded understanding of how competing policy logics produce both barriers and opportunities for meaningful e-learning transformation across China's academic HEIs.

Table 3.1 Advantages of adopting generic qualitative approach

Advantages	Generic Qualitative Approach
Flexibility	Offers considerable flexibility (Caelli et al., 2003), allowing researchers to explore a research question without being bound to the constraints of structured methodologies (Percy, et al, 2015). Unlike case study method, typically involves an in-depth, contextual analysis of a limited number of events.
Diverse Data Collection	Unlike methods such as ethnography, which requires immersion in the environment, or case studies, which focus deeply on a single instance, a generic qualitative approach enables researchers to use an diverse data sources. This versatility is particularly useful in studies aiming to gather a wide variety of perspectives on a phenomenon (Crestwell, 2012).
The Emergent Design	The emergent design of a generic qualitative study, which evolves in response to the data (Creswell & Poth, 2017), is less prescriptive than methods like grounded theory, which demands systematic data coding, or case studies, which require a bounded system.

To fully grasp e-learning implementation within China's academic HEIs, a qualitative research method is imperative. Qualitative research centered on inductive process is the fitting empirical inquiry which is effective in educational settings partly because “qualitative research is a particularly appealing design for applied fields of study such

as education, educational processes, problems, and programs can be examined to bring about understanding that in turn can affect and perhaps even improve practice” (Merriam, 1998, P.58) and partly because unlike statistical generalization (studies of samples or quantitative measures) used to gauge the possibility of things happening and confirm what might happen in certain scenarios, ‘fuzzy’ generalization arising from qualitative research method would focus on process rather than outcome (Bassey, 1999), articulate what has done in China and why, and better assist the researcher to develop a framework, therefore helping Chinese educators and administrators grasp how financial and technical support, human factors, and educational policies affect the integration of e-learning and educational practices. It is also practical to choose qualitative research method because selecting a good sampling from 1132 academic HEIs in China (MOE, 2023) would be very time-consuming and difficult. Opposed to quantitative research that use random samples, nonrandom samples are purposeful and enable the researcher to learn a great deal about problems of main significance to the aim of this research. More importantly, the design of qualitative research is very flexible and more feasible for adapting to the changing conditions of the research in process (Yin, 2012).

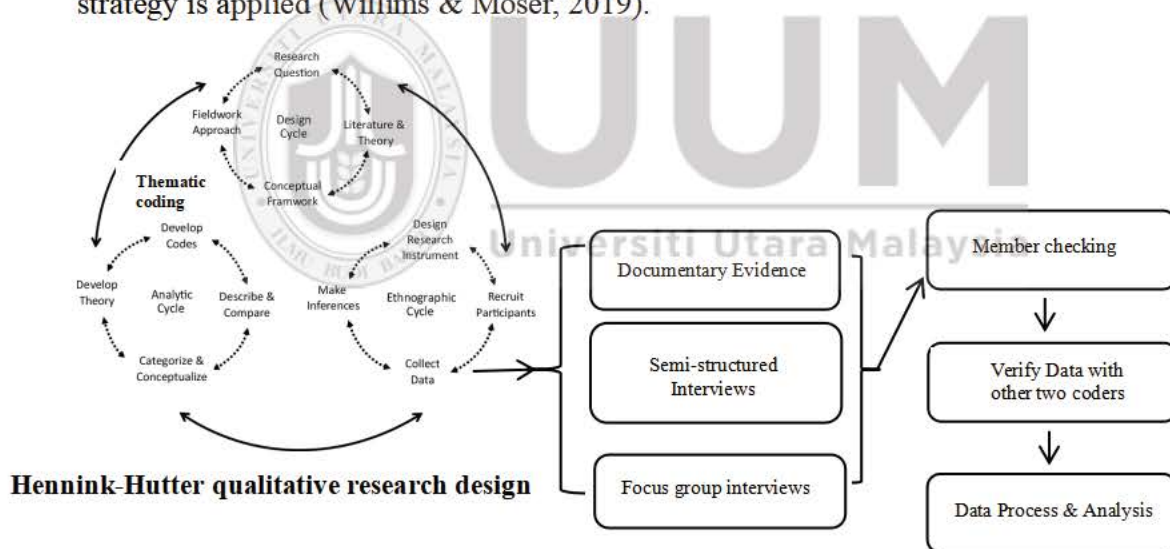
### **3.2 Research design**

This study seeks to understand the perceptions of administrators, faculty and students, IT specialists regarding e-learning from a policy perspective, specifically evaluating the financial, technical, and human factors at academic HEIs in China. Furthermore, it

aims to contextualize e-learning within these Chinese academic HEIs and assess the e-learning policy through an integrative lens. The core inquiry revolves around issues faced by China's academic HEIs in integrating e-learning into their pedagogical practices, noting a gap in comprehensive research on this specific context and issue. The choice to employ interpretivism in this study is grounded in several considerations. Interpretivism, from an epistemological standpoint, allows for subjectivity in research. This perspective posits that knowledge is constructed through interactions and interpretations, making it especially relevant for studies aiming to explore deep into perceptions, beliefs, and subjective experiences. Given the study's objective to gain a nuanced understanding of the challenges and perceptions surrounding e-learning at China's academic HEIs, interpretivism provides an appropriate methodological foundation. It aligns well with the study's approach where the researcher is actively involved in data collection and analysis, ensuring a harmonious relationship between the research method and data processing. In essence, interpretivism offers a framework that can yield rich, context-specific insights, vital for addressing the study's objectives.

As can be seen from **Figure 3.1**, individual components of research design have been demonstrated as follows: Design Cycle, Ethnographic Cycle, and Analytic Cycle. Research design in this qualitative study employs a model based on Hennink-Hutter qualitative research design, owing to its systematic yet flexible structure, which aligns closely with the complex, multi-layered nature of e-learning policy research in

Chinese higher education (Hennink, Hutter & Bailey, 2011). Aiming to develop a solid foundation for conducting research, the first cycle establishes four inter-related components: research questions, literature review, conceptual framework, and fieldwork method. This cycle has been particularly demonstrated in Chapter I & II. Ethnographic cycle, involving four objectives, is specifically designed for qualitative data collection, which is embedded in Chapter III section 3.3-3.6. Analytic cycle is composed of four steps: develop codes, describe and compare, categorize, and develop theory. For codes established for analysis, thematic coding is a major method. To develop an in-depth understanding of data, the open, axial, and selective coding strategy is applied (Willims & Moser, 2019).



**Figure 3.1 Outline of research design and data analysis**

**Source: Adopted from HENNINK, HUTTER & BAILEY (2011)**

### 3.3 Population and Sampling

In alignment with the generic qualitative approach, this study adopts a purposeful and context-sensitive strategy for selecting research sites to ensure that the data collected are both credible and representative of the diversity within China's academic higher education landscape. The target population comprises administrators, IT specialists,

faculty members, and students across academic HEIs, whose attitudes and experiences toward institutional e-learning policies are explored through semi-structured interviews, focus group discussions, and document analysis. These complementary methods allow for a multi-perspectival understanding of how policy is interpreted, implemented, and experienced at different institutional levels.

To enhance the reliability and trustworthiness of findings, the selection of participating universities is guided by three criteria. First, the sample institutions must represent diversity in sponsorship (public vs. private), institutional type (research-oriented vs. application-oriented), and geographic distribution (Central-East, Central, North, and North-East China). This diversity captures variations in policy interpretation and implementation shaped by differing institutional missions, funding structures, and regional developmental priorities. Second, the selected HEIs must have engaged in sustained e-learning practices—specifically, the integration of e-learning tools in teaching and learning for at least four consecutive years since 2018. Third, the institutions must have formally developed and enacted institutional e-learning policies for at least four years, ensuring that the study investigates mature, policy-informed e-learning ecosystems rather than pilot or experimental stages.

Accordingly, an initial pool of twenty academic HEIs (see Table 3.2) is identified based on these purposeful criteria. These twenty institutions are then stratified into four categories according to their key characteristics—funding source, geographic

region, and institutional orientation—each category comprising five universities. To strengthen fairness and reduce potential researcher bias while maintaining the integrity of purposeful sampling, purposeful random sampling is employed within each category. From every group of five, one institution is randomly selected, resulting in four final case institutions for in-depth qualitative inquiry. This balanced approach ensures both methodological rigor and contextual variation.

Table 3.2 Purposeful Random Sampling

Category	Selection Criteria	Universities in Group	Randomly Selected University
Category A	Central-east Region+ Research-Oriented/ Application-Oriented Public/Private University	A1, A2, A3, A4, A5	A3
Category B	Central Region+ Research-Oriented/ Application-Oriented Public/Private University	B1, B2, B3, B4, B5	B1
Category C	North Region+ Research-Oriented/ Application-Oriented Public/Private University	C1, C2, C3, C4, C5	C5
Category D	North-east Region+ Research-Oriented/ Application-Oriented Public/Private University	D1, D2, D3, D4, D5	D2

Source: Author's own work

Purposeful sampling is particularly appropriate in qualitative research, as it emphasizes depth, richness, and insight over representativeness (Patton, 2015). Unlike quantitative approaches that prioritize statistical generalizability, qualitative inquiry values theoretical and contextual transferability, enabling researchers to uncover the meanings participants assign to their lived experiences (Yin, 2012). The selection of the four academic HEIs thus enables a comparative and cross-contextual exploration of how institutional e-learning policies are shaped by structural, cultural, and operational factors across diverse educational contexts. This design aligns with the

study’s overarching aim—to uncover how policy intentions at the macro level are negotiated and materialized at the institutional and individual levels within China’s academic HEIs. Considering this, the researcher randomly choose four out 20 purposefully determined academic HEIs across China as samples and they are listed in Table 3.3.

Table 3.3 Sample University Code

University Code	Funding Sources	Geographic Location
A3	Public research university	Central China
B1	Public application-oriented universities	Central-East China
C5	Corporate university(application-oriented)	North-Central China
D2	Corporate university(application-oriented)	Northeast China

Source: Author’s own work

This study purposefully selected four stakeholder groups—faculty, administrators, IT specialists, and students—from the four participating academic HEIs to ensure comprehensive coverage of perspectives across institutional levels. Each group contributes distinct yet complementary insights into how e-learning policies are designed, implemented, and experienced within Chinese higher education institutions.

Faculty were included because they directly apply e-learning tools and interpret institutional policies in their teaching practices. Participants were drawn from various disciplines and academic ranks (junior lecturer to professor) to capture differences in pedagogical experience, digital competence, and exposure to training programs. Administrators were selected based on their involvement in policy development, implementation oversight, or resource allocation for e-learning initiatives, offering strategic insights into institutional decision-making and policy alignment. IT specialists were chosen for their role in managing technological infrastructures and

providing technical assistance, thus revealing the operational realities of e-learning deployment. Students were selected as primary end-users of e-learning technologies, representing years two to five, to provide informed reflections on learning experiences, accessibility, and engagement. Table 3.4 shows specific instrument allocated for each RQ.

Table 3.4 Instruments Allocated for Each Research Question (RQ)

	<b>Semi-structured interviews</b>	<b>Focus-groups interviews</b>	<b>Document analysis</b>
RQ1	Administrators, faculty, and IT specialists, to gain in-depth qualitative data on the intentions behind policies, challenges in deployment, and the effectiveness of e-learning systems.		Primary instrument. Documented policies and guidelines about e-learning. By examining these documents, the researcher can identify what e-learning policies are in place.
RQ2	Administrators, faculty, and IT specialists, to gain in-depth qualitative insights into the alignment and impact of e-learning policies.		Primary instrument. Collect and analyze institutional e-learning policies, strategic plans, and official reports to assess their alignment with the requirements of Education Informatization 2.0.
RQ3	Primary instrument Interviews with administrators could shed light on financial decisions, while discussions with Faculty could provide insights on finance aspects. Participants: Faculty & administrators		Utilize document analysis to understand the policy context, official stances, and any documented outcomes related to financial considerations in China academic HEIs.
RQ4	Primary instrument Semi-structured interviews offer flexibility in examining faculty perceptions of institutional policies, allowing for deeper exploration based on individual responses. Participants: Faculty	Gauging collective perceptions and shared experiences. Participants: Faculty	
RQ5	Primary instrument While typically for individual insights, they can also be employed with a subset of faculty and students to delve into their e-learning policy experiences in detail, especially when seeking to investigate specific issues or trends further. Participants: Faculty & Students	In a group setting, faculty and students can exchange e-learning experiences, revealing diverse perspectives by sharing both policy benefits and shortcomings, adding qualitative depth to survey data. Participants: Faculty & Students	

Source: Author's own work

Table 3.5 Sampling Strategies for Each Research Question

	Semi-structured interviews	Focus-groups interviews	Document analysis
RQ1	Participants: IT specialists, Faculty & administrators Purposeful sampling Sample size: Two administrators, Two IT specialists, 6 faculty from each of 4 Academic HEIs		Primary instrument  ✓
RQ2	Participants: IT specialists, Faculty & administrators Purposeful sampling Sample size: Two administrators, Two IT specialists, 6 faculty from each of 4 Academic HEIs		Primary instrument  ✓
RQ3	Primary instrument Participants: Faculty & Administrators Purposeful sampling Sample size: Two administrators and 6 faculty from each of 4 Academic HEIs		✓
RQ4	Primary instrument Participants: Faculty Purposive sampling Sample size: 6 Faculty from each of 4 Academic HEIs	Participants: Faculty Purposeful sampling Sample size decides on an initial number of focus groups at each of 4 Academic HEIs	
RQ5	Primary instrument Participants: Faculty and Students Purposeful sampling Sample size: 6 Faculty and students from each of 4 Academic HEIs	Participants: Faculty and Students Purposeful sampling Sample size decides on an initial number of focus groups and then determine if more are needed based on whether saturation is achieved	

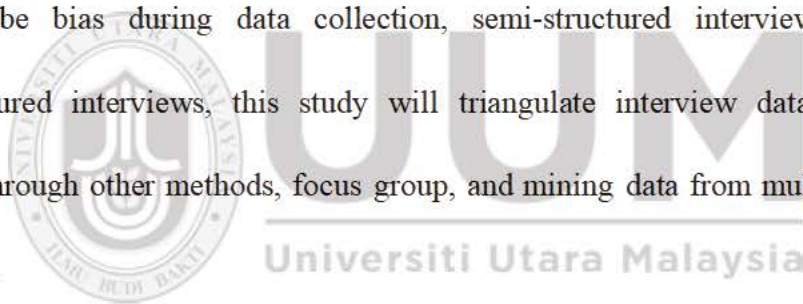
(Note: Participants who jointed in semi-structured interviews were not included in focus group interviews)

Source: Author's own work

### 3.4 Instrumentation

In this particular design, the researcher will be the key instrument, which is concerned with process of how administrators, IT specialists, students and instructors undertake e-learning practices. According to Brantlinger's (1997) theory for qualitative research, the following factors are considered for conducting this study. Firstly, inclined to comply with traditional research, the study is not impartial but specialized. Secondly, the researcher views himself as not a distant but a intimate instrument with participants. Thirdly, the research question mainly focused on experience and

opinions of students, instructors and administrators. Next, the key objective of this study is informative to the participants (administrators, IT specialists, instructors and students) and their organizations (academic HEIs). Fifth, the target population are students, IT specialists, administrators and faculty. Sixth, the researcher considered the study as neutral. Finally, the researcher regards himself and interviewees as proactive. The researcher, who is focused on e-learning practices, has more than twelve years' experience of using e-learning tools in teaching at one particular academic HEIs in China. In this case, a experienced and qualified researcher collaborating with other two coders, as instrument, will be highly effective and less likely to be bias during data collection, semi-structured interviews. Besides semi-structured interviews, this study will triangulate interview data with data collected through other methods, focus group, and mining data from multiple policy documents.



### **3.5 Pilot Study and Preparatory Phase**

Even though a standard pilot study was not developed for this research, three preparatory measures were structured to guarantee the clarity, reliability, and contextual appropriateness of instruments. Further, in qualitative research, pilot studies, not necessary, are often considered secondary due to the iterative and emergent nature of the methodology, which allows for evolving nature of instruments as understanding deepens (Creswell & Poth, 2017; Merriam & Tisdell, 2016). Also consider that practical constraints such as restricted access to participants, institutional

gate-keeping, and time limitations often render formal pilot studies less feasible, particularly in studies confined to specific educational settings (Marshall & Rossman, 2016).

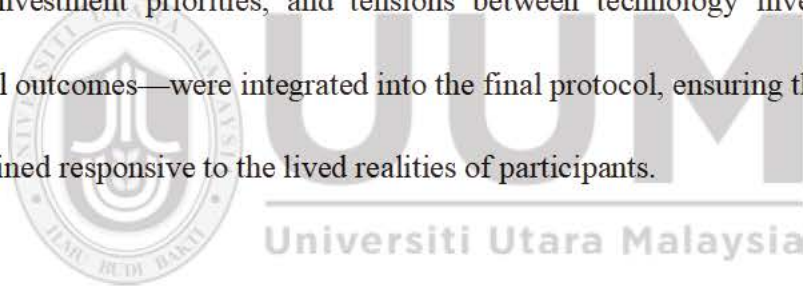
To be more specific, the researcher's decision to not employ a formal pilot study in this research was also methodologically informed by the adoption of CDA, Stakeholder Theory, and Activity Theory as the core analytical frameworks. Apparently, these perspectives centered on contextual interpretation, dynamic interaction among actors, and socially embedded practices. As such, they support an emergent and reflexive approach to data collection, where insights are iteratively generated and incorporated throughout the research process (Fairclough, 2013; Engeström, 2001; Freeman, 1984). Rather than requiring a rigid, pretest instrument, the frameworks, thereby, guided a flexible design that allowed the interview questions and structure to evolve organically in response to participant insights and theoretical reflection.

To support instrument development and explore initial reactions to the conceptual model, two small-scale focus group interviews were conducted during the early stages of the study. While these were not formally labeled as pilot sessions, they fulfilled a similar function by enabling the refinement of the research design. Considering University B among four universities provide the researcher with more convenience, the first focus group consisted of faculty at University B, while the second involved

students from the same institution. It is vital to adopt these two focus-group interviews, as these two group discussions provided early directions into how different stakeholders perceive institutional e-learning policies and experience technology integration in academic HEIs—aligning directly with the goals, Stakeholder Theory and Activity Theory, which prioritize multi-perspective understanding and interaction across institutional roles.

Albeit the data from the above focus group discussions were not included in the final analysis, their findings were pivotal in shaping the refinement of the semi-structured and focus group interview protocols. Specifically, the preparatory sessions revealed several contextual and cultural nuances that required methodological sensitivity (See Appendix X). For instance, certain technical and theoretical terms—such as Education Informatization, digital transformation, and institutional inertia—proved conceptually dense for some faculty and student participants. In response, the terminology used in interview questions was simplified, localized, and occasionally translated to ensure clarity and accessibility. Similarly, the discussions highlighted the influence of Chinese cultural norms, such as deference to authority and reluctance to critique institutional policies directly. To address this, the researcher reframed potentially sensitive questions into reflective or comparative formats, allowing participants to express perspectives more comfortably without feeling confrontational or disloyal to their institutions.

The pilot-like interactions also exposed practical and structural constraints within Chinese academic HEIs. Participants varied in their digital proficiency, prompting the inclusion of introductory “warm-up” questions to help bridge personal experience with broader institutional perspectives. Group dynamics, particularly the dominance of senior faculty/student voices, led to clearer assurances of confidentiality and, where needed, follow-up individual interviews to capture more balanced insights. Furthermore, overlapping or redundant questions identified during the early discussions were consolidated, and the interview duration was shortened to accommodate busy academic schedules. Finally, emergent topics—such as budget conflicts, investment priorities, and tensions between technology investment and pedagogical outcomes—were integrated into the final protocol, ensuring the interview guide remained responsive to the lived realities of participants.



This iterative and reflexive process exemplified the adaptive logic of CDA, which emphasizes the dynamic alignment between data, context, and discourse. Rather than adhering to a rigid, pretested design, the researcher continuously refined the instruments in light of empirical feedback, cultural considerations, and theoretical coherence. This approach not only enhanced the contextual appropriateness and reliability of the instruments but also ensured that the language, tone, and focus of the interviews (Denzin & Lincoln, 2018) authentically reflected the institutional and sociocultural realities of Chinese higher education.

### **3.6 Validity and reliability of the instruments**

To verify the quality of this research and show that this research is well-planned and established on a solid base, two factors will be examined and they are validity and reliability. As Yin (2012) suggests that it is no necessary to test internal validity for descriptive or exploratory qualitative research, three criteria, construct validity, external validity, and reliability, designed for examining the value of research layout will be discussed in the following.

To ensure construct validity, the design of this study meticulously aligns with its research objectives by selecting a diverse set of universities that represent the landscape of academic HEIs in China. This approach supports a comprehensive examination of institutional e-learning policy, the financial implications of e-learning initiatives, and the role of these policies in promoting integrative support across various academic HEIs. By including research and application-oriented universities, the study gains insights into institutions with distinct missions — research-oriented universities centred on theoretical innovation and application-oriented universities focused on practical, industry-based education. This combination ensures that the study can effectively construct a thorough understanding of institutional e-learning policy centered on technical, financial, and pedagogical challenges across diverse academic HEIs. Further, the inclusion of public and private academic HEIs across Central-East, Central, North, and Northeast China provides geographic diversity, accounting for regional variations in economic development, educational

infrastructure, and policy application.

In qualitative research, selecting a small but diverse group of institutions is a well-established methodology that effectively balances depth with diversity in analysis. Scholars such as Yin (2018) and Patton (2002) have emphasized the importance of purposive sampling, which allows researchers to choose institutions with varied characteristics, thereby enhancing the relevance and transferability of findings. Yin notes that this approach enables "analytic generalization," particularly in qualitative studies that explore institutional dynamics and policy implications. Similarly, Stake (1995) highlights the value of including institutions with different missions, such as research-intensive versus teaching-focused, as this can reveal significant insights into how distinct institutional goals affect policy outcomes. This perspective reinforces the need for selection criteria that capture the depth—through detailed data collection—and breadth—by including contrasting institutional types. Furthermore, Creswell and Poth (2017) advocate incorporating diverse geographic and institutional types to achieve "maximum variation," thereby strengthening construct validity by encompassing a broad spectrum of contexts. By focusing on research universities, application-oriented institutions, and both public and private entities across multiple regions in China, this study adheres to these established methodologies, ensuring a comprehensive understanding of e-learning policies that are nuanced and applicable to academic HEIs across China.

In this study, to maximize the quality of reliability, two data processors, experienced professors who had sample experience with qualitative research and analysis methods including coding, participated in coding and text-converting of the interviews, and the synthesis of qualitative codes. The researcher co-worked with these two data processors for coding all the interviews. More precisely, this coding comprised the coders consistently reconciling and pondering their interpretations of the interviews to maintain agreement and coherence across all discussions. Employing multiple coders to scrutinize the interview transcripts and recordings constitutes a triangulation method for the study, mitigating potential biases that might arise during the data coding process (Cohen & Crabtree, 2006).

Also, triangulation strengthen the reliability of the data mined in interviews undertaken in this research. To augment the reliability of this research, the researcher intended to obtain as many viewpoints of participants as possible through recruiting broadly. The triangulation method also played a role in coding and deciphering interviews coupled with other two coders, as described in this passage before. To employ a team of researchers to undertake comparative analysis of each coder's findings clearly elucidated the method, triangulation, also used in investigator triangulation. An further example of triangulation was utilized through context triangulation, which delineate interpreting the area of focus in various educational contexts. Throughout this dissertation, participants and interviewees at four universities shared their experiences of employing e-learning technologies in their

teaching and learning practice. Reaping rich viewpoints of participants in multiple educational settings added value to the credibility and trustworthiness of this research. Thereby, with triangulation method, the possibility that the data collection procedures can be repeated with no alternative outcomes is highly enlarged.

### **3.7 Procedure of data collection**

Procedure of data collection in this study is mainly relied on five steps, which is recommended by Creswell (2012). To begin with, participants from sampled universities involved in this inquiry are identified by using purposeful sampling (interviews). They are four diverse Chinese academic HEIs across China in terms of their e-learning policy types, sponsorship and geographic locations. IT specialists, instructors and administrators who experienced e-learning for at least two years are selected participants based on locations and people who can help the researcher grasp research questions. Second, to gain access to interviewees, the researcher will submit written documents to gain permissions. Such documents include detailed information about why their universities was targeted for research, what goals will be completed during the inquiry, how much time do the researcher need for conducting interviews, what unexpected things there is for the presence of interviewer to be disruptive, how will the researcher make use of data and communicate the research findings, and what administrators, IT specialists, faculty, and students at these China academic HEIs will obtain from the inquiry. Thirdly, three qualitative types of data will be gathered.

### *Focus group interviews*

Focus group interviews are highly effective for qualitative research, offering a dual advantage of efficiency and depth in data collection. As Krueger and Casey (2015) explain, focus groups enable researchers to collect diverse viewpoints from multiple participants in a single session, making the method time-effective and resource-efficient. Furthermore, Morgan (1997) emphasizes that the interactive dynamics within focus groups often lead participants to expand on each other's ideas, fostering rich, nuanced discussions that might not emerge in one-on-one interviews. These qualities make focus groups particularly valuable for mining data rapidly while also achieving an in-depth understanding of participants' perspectives. The research aims to use focus group discussion in the first stage, and then moved to one-on-one interviews.



According to Morgan (1997), focus group interview is fit when there is a pressing need to mine rich data from recording the issues discussed in a group setting. Owing to the fact that this study has developed a preliminary model, the group discussion would provide insights for understanding the essence of this model and how factors of this model influence the performance of e-learning in teaching and learning at academic HEIs. For this purpose, two separate focus groups interviews were undertaken first. One involved faculty who work at university B, and other one involved students who study at university B. Focus group interviews lead to the production of results regarding the further adjustment of conceptual model. These

ideas were later used in semi-structure interviews, for exploring in-depth understanding of the central topic.

### *Semi-structure interviews*

In semi-structured interviews, conversations will be audio-taped and transfer into written forms. In addition, open-ended questions, mostly consisted of experience and value questions, will be used in one-on-one interviews. Using conceptual framework to guide the process of data collection, the research will use charts and tables to classified and record relevant information. Fourth, an example of interview protocol guiding semi-structured interviews is presented in **Figure 3.2**. Fifth, in order to make sure the whole process is ethical, the research will follow strict guidelines during and after the interview. Most importantly, protection of the privacy and confidentiality is the researcher's priority.

Protocol of Interview
Specific Name: Perceptions of institutional e-learning policy at China academic HEIs Time allocation: Date: Location: Interviewer: Interviewee: Occupation of interviewee:
<b>Specific introduction for interviewee</b> 1 The objectivity of the research 2 What type of data will be recorded 3 Measures for protecting the privacy of the interviewee 4 How much time do the interview need Then interviewee read and sign the consent form Turn on the voice recorder and pretest
<b>Sample Questions:</b> 1 What were the primary goals and intentions when your institution developed its e-learning policies? How do these objectives reflect the institution's commitment to integrating e-learning? 2 How do the e-learning policies align with the broader strategic goals of your institution? In what ways do they support the overall mission and vision of the university? 3 Could you describe the process your institution followed to formulate its e-learning policies? Who were the key stakeholders involved, and how did their input shape the policies? 4 What specific resources or infrastructure have been allocated to ensure these policies are effectively implemented? 5 How does your institution ensure that its e-learning policies remain relevant and adaptable to new technological advancements and educational practices? 6 Are there any upcoming revisions or improvements planned to enhance these policies?
Thanks for participants' contribution and reassure about their confidentiality.

Figure 3.2 Protocol of Interview  
 Source: Adapted from Crestwell (2012)

### *Document analysis*

Documentary sources, including reports, unpublished documents, meeting minutes, emails, and agendas, were analyzed thematically to identify key themes related to the critical aspects of Education Informatization 2.0 and institutional e-learning policy components. The analysis also focused on understanding how these themes contribute to the broader context of e-learning policy and its practical implications. Particular attention was given to examining how institutional e-learning policies emphasize allocating support from financial, human, and technical perspectives, providing insights into the structural and operational foundations necessary for effective

e-learning implementation. To strengthen understanding of policy documents, this study employ CDA as an interpretive framework to unravel underlying assumptions, power relations, and ideological constructs implanted in policy texts.

For analyzing the macro-level policy documents, Education Informatization 2.0 (MOE, 2018) and action plan of Education Informatization 2.0 (MOE, 2022) are the main policy documents. From the micro-level, a criteria for screening policy document for institutional e-learning policies from four universities were used (See table 3.6). The collected archival records were examined to trace the sequential evolution of e-learning policies across universities A3, B1, C5, and D2.

Table 3.6 Inclusion and Exclusion Criteria for Screening Documents

Criteria Type	Inclusion Criteria	Exclusion Criteria
Content Specificity	Documents must explicitly discuss e-learning policies, guidelines, or frameworks, particularly those relevant to Education Informatization 2.0 in China.	Exclude documents that reference educational technology or digital learning only in passing, without a focus on formal policies.
Relevance to HEIs	Documents should focus on policies implemented within HEIs in China and target faculty, administrators, or IT staff regarding e-learning.	Exclude documents that broadly address education policies without specific mention of e-learning or digital learning components.
Focus on Key Aspects	Include documents addressing financial aspects (investment, funding), technical support, and pedagogical considerations aligned with policy requirements.	Exclude documents that focus solely on general technological trends in education, lacking specific policy or institutional context.
Policy Impact	Documents that discuss the perceived or measured impact of e-learning policies on faculty, students, or administrators should be included.	Exclude any content that does not specifically relate to the context of HEIs or the Chinese education system, unless providing applicable insights.
Policy Updates	Include documents describing recent updates or adaptations to e-learning policies to meet new needs or technological advancements.	Exclude outdated policies (e.g., older than 2018) unless they provide foundational background.
Time Period	Policy documents generated between 2018 and 2024 are included.	Policy documents generated before 2018 are excluded.

Source: Author's own work

### 3.8 Procedure of data analysis

According to **Figure 3.3**, six stages of data analysis for thematic analysis are employed in this particular study (Braun & Clarke, 2006; Creswell, 2012).

Procedures	Actions
Preparing and organizing data	Build a matrix and tables; Classified information into various themes by their characteristics; Have multiple copies of all sources of data; Use qualitative analyzing software(NVivo)
Exploring and coding the database	Conduct a first-phase exploratory analysis design a image-displayed model for coding procedures; Open coding, Axial Coding and Selective coding strategy
Describe findings and forming themes	Interpret and build themes from data, then outlay them; Find the interconnection among various themes and connect them
Representing and reporting findings	Create a comparison and contrast table; Established a pyramid with hierarchical level; Use figures and tables and map them; Use written words to convey research outcomes
Interpreting the meaning of the findings	Conduct a discussion of key findings and express how research questions were responded; Thoughts of the researcher about the quality of data; Compared and contrast with previous studies; Sum up the research outcome
Validating the accuracy of the findings	Triangulation/Member checking/External audit

Figure 3.3 Six steps in the process of analyzing and Interpreting qualitative data

Source: Adopted from Creswell (2012)

To ensure the credibility and trustworthiness of the findings, multiple validation strategies were employed. Member checking involved sharing preliminary themes and interpretations with faculty, administrators, IT specialists, and students to confirm that the findings accurately reflected their experiences with institutional e-learning policies, allowing participants to clarify or correct misinterpretations. Inter-coder discussions with two experienced professors ensured consistency in coding, categorization, and the identification of modality, agency, and silences. Discrepancies were resolved through consensus, and the textual tree layout was refined, enhancing analytical rigor and reducing subjectivity.

A comprehensive audit trail documented all stages of data collection, coding, thematic

development, and reflective memos, providing transparency and enabling verification of the analytic process. An external audit by a senior qualitative research expert further assessed the alignment of interpretations with research questions. Collectively, these strategies supported the interpretation of key findings, evaluation of data quality, and comparison with prior studies, ensuring that conclusions regarding the financial, human, and technical dimensions of e-learning policy implementation in Chinese academic HEIs are robust, credible, and systematically grounded.

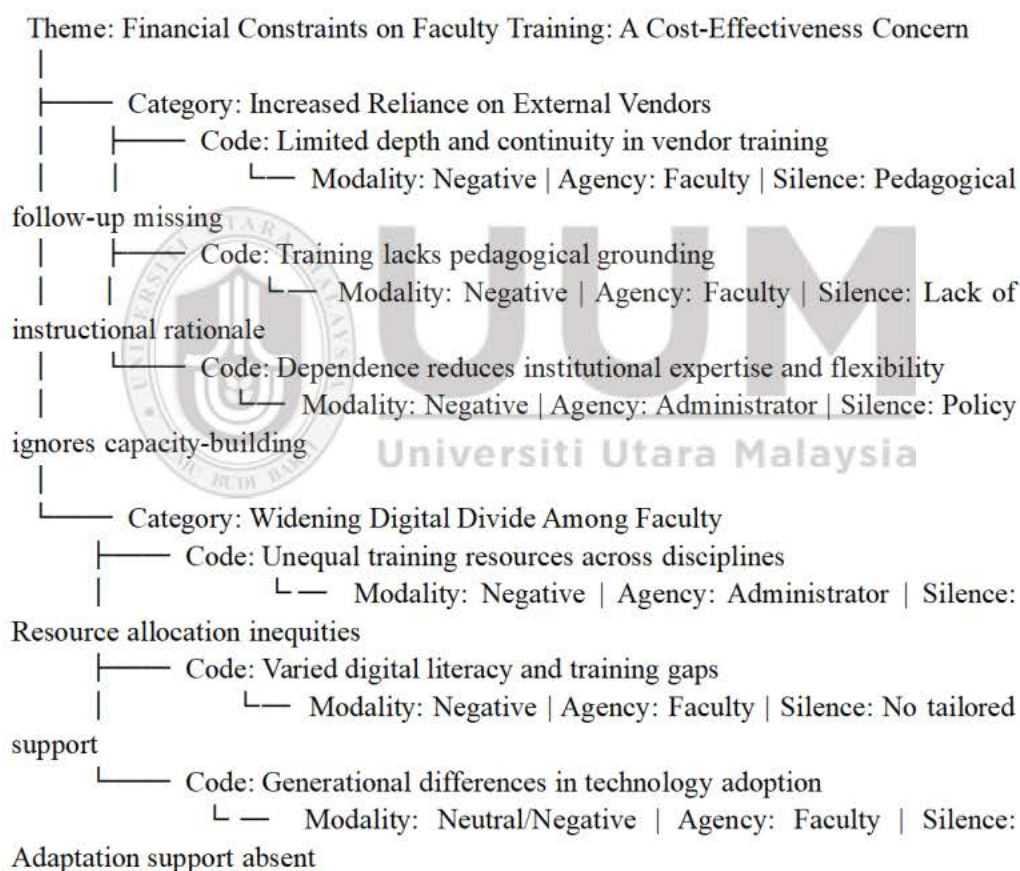


Figure 3.4 Textual Tree Layout for Coding Process

Source: Author's own work

One coding example (See Figure 3.4) has been displayed. The analytic process begins by identifying themes that capture overarching patterns in the data, such as financial constraints on faculty training. Within each theme, categories are established to group

related experiences or perceptions, for example, increased reliance on external vendors and widening digital divides among faculty. Next, codes are assigned to specific participant statements to represent distinct ideas or concerns, such as limited depth in vendor training or unequal resources across departments. For each code, modality is assessed to determine the evaluative stance of participants (positive, negative, or neutral), while agency identifies who enacts or experiences the effect, such as faculty or administrators. Finally, silences are examined to uncover what is missing or unaddressed in policy or practice, highlighting gaps that participants implicitly reveal, thereby linking micro-level observations to broader thematic insights.

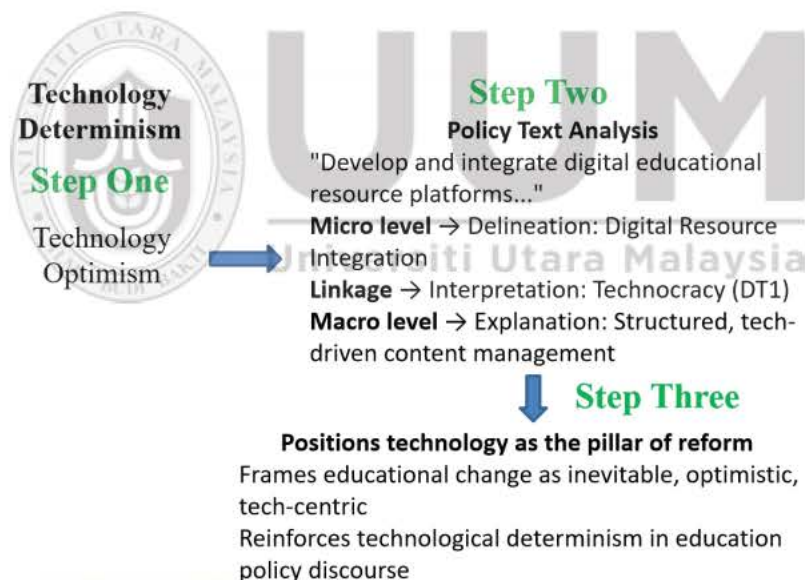


Figure 3.5 The Outline of CDA analysis

Source: Author's own work

Other coding example for discourse analysis displays as following. CDA reveals that Education Informatization 2.0 frame technology as the central driver of educational reform, reflecting an optimistic, deterministic vision of digital transformation (See Figure 3.5). Yet, stakeholder perspectives—drawn from faculty, administrators, IT

staff, and students—show how this vision encounters practical constraints. Faculty struggle with pedagogical adaptation, administrators face funding and training limitations, and students report uneven access and usability. Thus, while policy discourse promotes a technocratic ideal of progress, its implementation is shaped and often moderated by human agency, institutional realities, and contextual contingencies. Integrating CDA with stakeholder insights exposes the gap between the rhetoric of technological reform and the lived experience of e-learning in Chinese academic HEIs.

### **3.9 Limitations**

Purposive sampling is a specialized method where participants are chosen based on particular characteristics, often resulting in smaller sample sizes compared to random sampling (Etikan, Musa, & Alkassim, 2016). This selective nature can constrain the diversity of participants, potentially impacting the generalizability of findings (Palinkas et al., 2015). If such a sample is not fully representative, especially in the context of academic Higher Education Institutions (HEIs) in China, the results may not authentically represent broader experiences, limiting their applicability to the wider population (Battaglia, 2008).

To address the limitations of purposive sampling, which often results in smaller, potentially less diverse samples (Etikan, Musa, & Alkassim, 2016), the researcher adopts several strategies. Transparently documenting selection criteria and participant

characteristics offers clarity to readers about the research context (Palinkas et al., 2015). Employing triangulation, which uses multiple data sources or methods, can augment the credibility of findings (Patton, 2002). Acknowledging the inherent limitations of purposive sampling can further ensure robustness, especially in contexts like academic HEIs in China. Additionally, seeking participant feedback on preliminary results and slightly broadening the selection criteria can enhance the comprehensiveness of the study (Creswell & Miller, 2000; Palinkas et al., 2015).

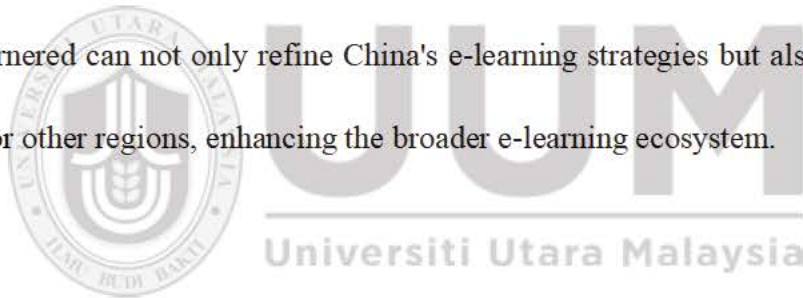
### **3.10 Conclusions**

#### **3.10.1 Summary**

This exploratory study employs a generic qualitative research approach to delve into the e-learning experiences and attitudes within selected academic HEIs from an integrative perspective in China. Using purposive sampling, the researcher identifies specific faculty members, students, IT specialists, and administrators as our participants. The research methods encompass semi-structured & focus group interviews, and a comprehensive analysis of pertinent university documents like e-learning policies and reports. Through content analysis, the collected data will be examined for patterns, themes, and insights regarding e-learning implementation. As the study compares data from varying sources, a holistic picture of e-learning in these institutions will emerge. Paramount to this research is the ethical component; this study prioritizes obtaining informed consent from participants, safeguarding their confidentiality, and strictly adhering to ethical research standards, ensuring that the participants' rights and well-being are at the forefront throughout the study.

### **3.10.2 Potential contribution**

Conducting an exploratory study on e-learning implementation in Chinese academic HEIs from an integrative perspective, encompassing policy, human, financial, and technical factors, can lead to a comprehensive understanding of the e-learning landscape. Such an approach pinpoints discrepancies between e-learning offerings and user needs, aiding in optimizing policies and resource allocation. The inclusion of human factors emphasizes user experience, ensuring e-learning solutions align with educators and students' genuine needs. Moreover, by fostering stakeholder collaboration, this perspective promotes shared ownership of e-learning initiatives. Insights garnered can not only refine China's e-learning strategies but also serve as a blueprint for other regions, enhancing the broader e-learning ecosystem.



## **CHAPTER FOUR**

### **RESEARCH FINDINGS**

#### **4.1 Introduction**

This chapter not only deciphered data from document analysis and a CDA of institutional e-learning policies between 2018 and 2024 at Chinese academic HEIs, focusing on their status quo, and their alignment with the technological and pedagogical requirement of Education Informatization 2.0, but also interpreted data collected from interviews of stakeholders. Special attention is given to the dynamic interplay among institutional e-learning policy, financial, human, and technical factors that influence the success of e-learning initiatives.

The chapter is organized to first identify the status quo and provide a CDA of e-learning policies. It then decodes data about the alignment of these policies with the principles of Education Informatization 2.0, while examining financial considerations, the pivotal role of technical support, faculty's professional development in digital literacy and pedagogical skills, and students' digital literacy. Finally, the chapter synthesizes these findings and highlights discrepancies between policy objectives and their practical implementation.

By exploring these interconnected aspects, the chapter offers a comprehensive interpretation of how institutional e-learning policies shape the evolving landscape of

e-learning in academic HEIs in China, beginning with an identification of their status quo.

## 4.2 Status Quo of Existing Institutional E-learning Policies

E-learning policies encompass more than formal policy documents; it includes a comprehensive framework addressing curriculum and content delivery, assessment and evaluation mechanisms, technology integration, institutional support systems, resource allocation, and provisions for flexibility and autonomy. The following table 4.1 shows how policy framework in Chinese higher education contexts highlights key aspects of institutional e-learning policies.

Table 4.1 Key aspects of Institutional E-learning Policies Scattered and Embedded in Institutional Educational Policy

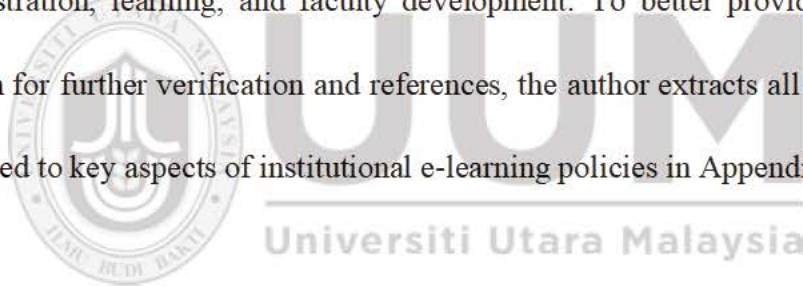
University Code	Institutional Educational Policy	Key aspects of Institutional e-learning policy												
		GGE	MVS	DSP	AI	CDS	CDD	FT	SS	FM	CPG	OM	ECE	EET
	Long-term educational plan	√	√											
	Institutional course grading scale guidelines								√				√	
	Faculty's professional development scheme							√						√
	Undergraduate Education Program & Syllabus								√		√			√
A3,B1,	Data Security & Privacy Protocol			√										
C5, and D2	Online & Hybrid Courses Design policy				√	√						√		
	Financial plan and budgeting procurement													√
	A guideline to use online library database								√					√
	Course Rating Index									√			√	
	Undergraduate Program Assessment				√	√	√							

Note: GGE=General Guidelines of E-learning Policy; MVS=Mission & Vision Statement of E-learning Policy; DSP=Data Security & Privacy; AI=Accessibility & Inclusion; CDS=Course Delivery System; CDD=Course Design & Development; FT=Faculty Training/Faculty Professional Development; SS=Student Support; FM=Feedback Mechanism; CPG=Certification Policies & Guidelines; OM=Ownership of Material/Copyright; ECE=E-learning Course Evaluation; EET=Emerging E-learning Technologies (such as AI, AR/VR)

Source: Adapted from Hu, Raman, & Shan (2025)

As what have been discussed in the section of 2.2.2.1 and 2.2.2.2, key aspects of institutional e-learning policy have been identified in the table. However, owing to the

unique context of Chinese Academic HEIs, institutional e-learning policies are integrated into institutional educational policy at universities A3, B1, C5, and D2. There is no standalone institutional e-learning policies embraced all key components (See Table 4.2), but many scattered and embedded in various education policies. For example, all four universities have developed a long term educational plan between 2016 and 2020, 2021 and 2025, these two stages of educational plan involve general guideline of e-learning policy and strategic plan, which outlines a multi-dimensional approach to Education Informatization in higher education. It identifies strategic goals, provides tasks to be completed, and stresses the importance of integrating technology for administration, learning, and faculty development. To better provide sufficient information for further verification and references, the author extracts all information highly related to key aspects of institutional e-learning policies in Appendix A-to-D.



This section facilitates the evaluation of whether the e-learning policies at these institutions are systematically structured or remain unstructured, identifies the policy evolution and strategic focus shifts from 2016-2020 to 2021-2025, and provides a nuanced understanding of their alignment with institutional goals and broader educational imperatives-Education Informatization 2.0. To investigate the current state of institutional e-learning policies across four universities, this study employs a specific bench-marking tool adapted from Czerniewicz and Brown's (2009) research.

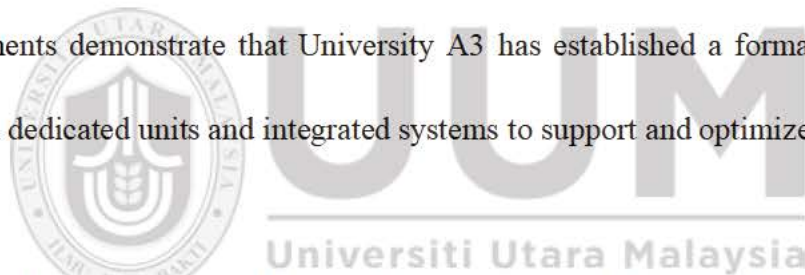
Table 4.2 Institutional e-learning policy types

Categories	Structured E-learning Policy	Unstructured E-learning Policy
Senior-level support	Policy document	No Policy document
E-learning structures	Centralized support unit	No formal support unit (probable fragmentary or ad hoc support)
Institution-wide system	Institutionally supported online learning management system (LMS)	No or ad hoc LMS

Source: Adopted from Czerniewicz and Brown (2009)

University A3's e-learning policies are structured. The framework encompasses multiple LMS platforms, including Superstar Learn, Treenity, and Rain Classroom U-Campus with components for course delivery, course design and certification, faculty and student digital literacy training programs, and support systems such as technical assistance, IT consultation services, and a one-stop student service platform.

These elements demonstrate that University A3 has established a formal e-learning policy with dedicated units and integrated systems to support and optimize e-learning.



University B1's e-learning policies exhibit a structured framework. This system encompasses a formalized digital education infrastructure with various online and hybrid learning platforms, a set of protocols for course design and accreditation, and various training initiatives to cultivate digital proficiency among faculty and students. Furthermore, the university offers support mechanisms, including a digital library, electronic repositories, and an IT framework. These components collectively affirm that university B1 has instituted a formalized e-learning policy with e-learning platforms and an integrated governance model to fortify and elevate digital pedagogy.

University C5's e-learning policies embody a structured framework. This system integrates a formalized digital education infrastructure with various online and blended learning platforms, established course design and certification protocols, and targeted faculty and student training initiatives aims to enhance learning outcomes. The university adopts multiple LMS platforms, including Superstar Learn, Treenity, and Rain Classroom to facilitate interactive and accessible learning experiences. Additionally, support mechanisms—such as electronic databases, research tools, and mobile learning applications—provides academic assistance.

University D2's e-learning policies exemplify a structured framework, anchored in a governance model and a smart education system. The university employs e-learning platforms, such as iFlytek AI Classroom, Rain Classroom and Superstar Learn, to enhance interactive and AI-driven pedagogy. A course development structure provide fixed timelines, mandates faculty engagement, and integrates virtual simulations alongside national academic resources. Faculty and student training initiatives, including digital literacy programs, aims to bolster pedagogical innovation. Supported by an online library, IT services, and a dual-tier quality assurance system for course delivery, the university continues to refine its e-learning ecosystem.

Based on above interpretation of the existing institutional e-learning policies at each university and their sources of funding, this table assigns codes to the universities as

follows: A3, B1, C5, and D2. In order to make these universities easier to recognize, the author make them short for A, B, C, D (See table 4.3).

Table 4.3 Institutional Code and its institutional e-learning policy type

Institutional Code	Institutional e-learning Policy type	Funding Sources	Geographic Location
A	Structured	Public research university	Central China
B	Structured	Public application-oriented universities	Central-East China
C	Structured	Corporate university (application-oriented)	North-Central China
D	Structured	Corporate university (application-oriented)	Northeast China

Segmented by policy types, funding sources, and geographic diversities

Source: Author's own work

#### 4.2.1 Strategic focus of e-learning policies shifts from 2016-2020 to 2021-2025

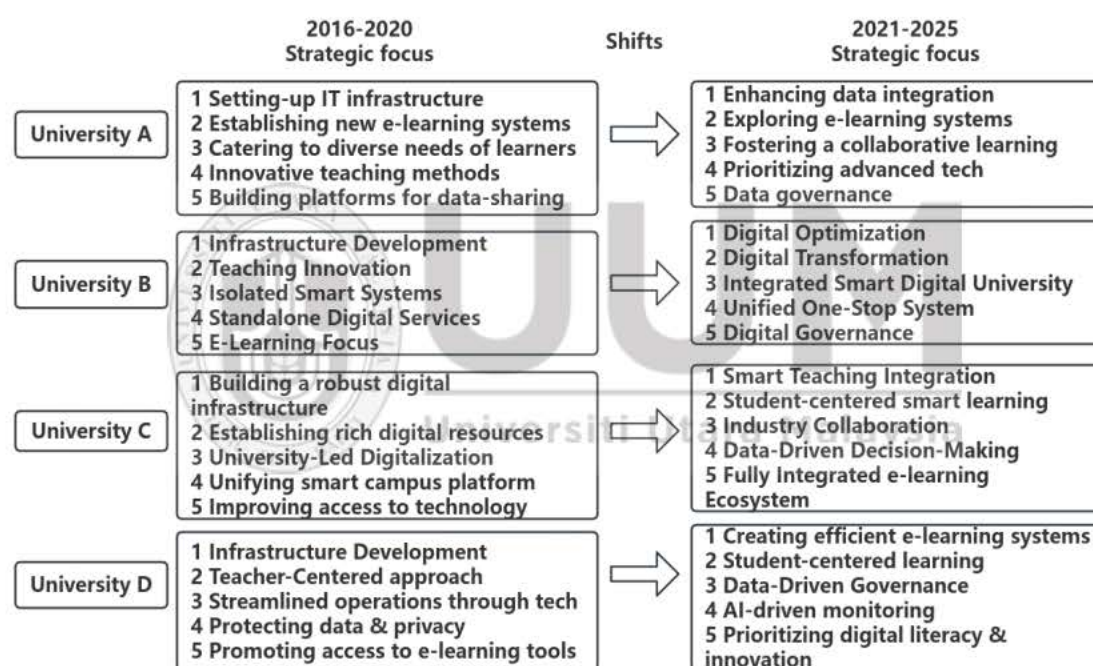


Figure 4.1 Focus Shifts From 2016-2020 to 2021-2025

Source: Author's own work

The evolution of e-learning policies (See Figure 4.1) across universities A, B, C, and D reflects a broader shift from infrastructure development (2016-2020) to optimization, interactivity, data-driven learning, and technology integration and innovation (2021-2025). While all universities initially focused on establishing ICT infrastructure, their current policies prioritize enhancing teaching methodologies,

integrating advanced technologies, and fostering student-centered learning. Four main dimensions of e-learning policies are listed as following:

- *Integrating e-learning in teaching*
- *Development of e-learning platforms*
- *Innovative teaching methods*
- *Student-centered learning*

### *Integrating E-Learning in Teaching*

University A transitioned from focusing on basic e-learning infrastructure, such as cloud systems and smart campus cards, to emphasizing data integration, security, and collaborative teaching. The 2021-2025 plan introduces multimedia resources and smart classrooms, creating a more interconnected and interactive learning environment. University B followed a similar trajectory, shifting from digital learning environments to full-scale Education Informatization, improving network stability, data sharing, and AI-driven services. University C, on the other hand, evolved from infrastructure development to smart teaching integration (innovative teaching), utilizing Data-driven learning analytics and digital platforms to enhance personalized learning experiences. University D took a distinct approach, shifting from teaching efficiency and digital access to adaptive, student-centered education, with a strong emphasis on self-directed learning and data-driven student assessments. To find a better match for incorporating LMS into teaching, all four universities frequently introduce new e-learning strategies, which encourage faculty to transition from one to

another among various LMS vendors (SuperStar Learn, Rain Classroom, Treenity, U-Campus, and so on).

#### *Development of E-Learning Platforms*

Universities also diverged in their approaches to e-learning platforms, reflecting their institutional priorities. University A focused on exploring various e-learning platforms, ensuring better governance, streamlined administration, and an improved user experience. University B integrated its various digital services into a unified administrative and learning system, enhancing efficiency. University C expanded its digitalization efforts by introducing data-sharing systems and external partnerships, such as its collaboration with Huawei, to accelerate e-learning innovation. University D prioritized AI, IoT, and big data-driven education platforms, moving towards a fully integrated smart learning that offers personalized and adaptive learning experiences. Although four universities employ various approaches to embrace e-learning, they mirrors a shared goal.

#### *Innovative Teaching Methods*

Universities have also evolved in their adoption of innovative teaching approaches. Universities A and B focused on improving interactivity, multimedia integration, and collaborative learning, ensuring a more engaging smart classroom experience. University C emphasized Data-powered learning analytics, digital content creation, and personalized learning, allowing for adaptive and student-centered education.

University D, in particular, made a significant shift from teacher-centered to student-centered learning, promoting lifelong learning, self-directed education, and data-driven assessments that help students develop autonomy and problem-solving skills.

### *Student-Centered Learning*

The focus on student-centered learning is evident across all universities but manifests differently. Universities A and B intends to work on enhancing e-learning governance and service efficiency, ensuring smooth faculty-student interactions through improved e-learning platforms. University C aims to adopt data-driven decision-making to provide personalized learning paths, integrating technology to enhance student engagement. University D plan to place the emphasis on digital literacy, problem-solving skills, and adaptive learning, ensuring students develop future-ready competencies for a rapidly evolving digital landscape.

Universities A and B shifted from building IT infrastructure to optimizing e-learning services by enhancing interactivity and governance, while University C prioritized smart learning environments with Data-driven analytics and industry collaborations (e.g., with Huawei) to drive innovation. In contrast, university D emphasized student-centred learning, data-driven decision-making, and digital literacy to foster autonomous learning skills. Although all institutions evolved from fundamental infrastructure to integrated smart digital systems, their priorities differ—universities C

and D focus on Data-driven personalized education, whereas universities A and B concentrate on platform governance and service efficiency—highlighting how each tailors its e-learning strategy to its unique technological priorities and educational objectives.

#### **4.2.2 Alignment with institutional goals**

At four universities, e-learning policies are integrated within the broader institutional policy such as long-term educational plan, but their approaches vary in scope and detail. University A's policy closely aligns with the institution's mission of fostering academic excellence and regional development, emphasizing data governance, collaborative learning, and accessibility to ensure equitable resource access for all students. On the other hand, University B's policy is more detailed, focusing on enhancing digital competency and data literacy by integrating advanced e-learning technologies and creating a seamless, intelligent learning environment to equip students for a data-driven future.

In contrast, University C's policy is primarily operational, concentrating on fostering e-learning environment and implementing smart campus technologies to optimize resource allocation and teaching efficiency. Meanwhile, University D takes a comprehensive approach, embedding data-driven reforms and technology integration into teaching practices, aiming to create a modern educational ecosystem that continuously adapts to the evolving needs of students and Faculty. Each institution

reflects distinct approaches for integrating e-learning, with University A focusing on accessibility and regional impact, University B emphasizing students' digital literacy and advanced e-learning technologies, University C enhancing operational efficiency, and University D fostering educational reforms.

#### **4.2.3 Policy-making process**

At four universities, institutional e-learning policies are embedded in long-term educational plan, with the alignment of the tenets of Educational Inforamtization 2.0. As it is critical to identify who are involved in e-learning policy-making process, and what influences do they possess, each university's policy-making process will be illustrated and discussed in this section.



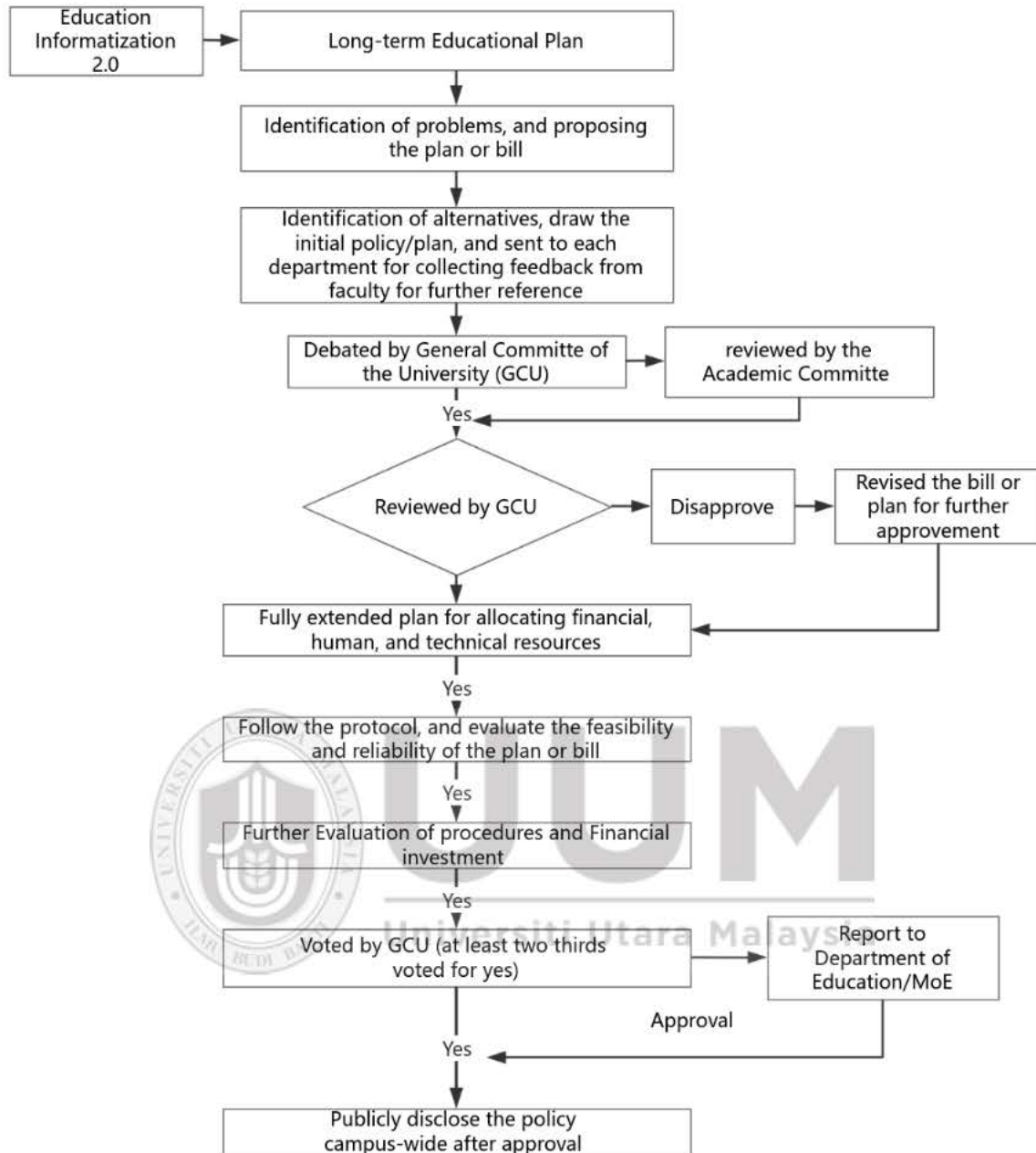
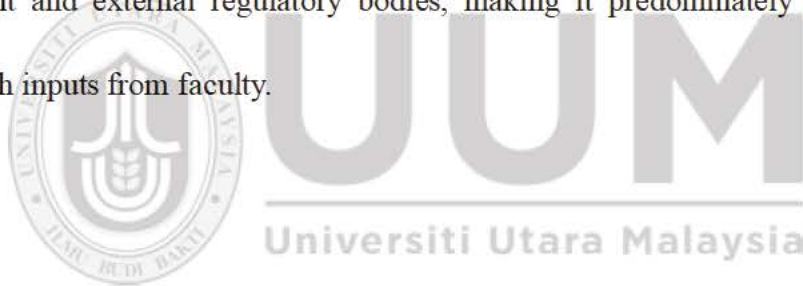


Figure 4.2 University A's policy-making process

The policy-formulation process at University A (See **Figure 4.2**) follows a structured procedures that are top-down-oriented. As the initial plan is drafted by the appointed teams, its draft will be sent to each department collecting feedback from faculty for further reference. Consisting of department heads and deans, the Academic Committee reviews and refines these proposals. Top management, the General Committee of the University (GCU), plays a central role in debating, reviewing, and

evaluating the viability of the legislation, including financial, human, and technical resource allocation, before its final agreement. University A is a public university whose funding primarily comes from the government, so any large-scale plans related to investment in digital infrastructure, e-learning tools should report to the Department of Education. Once endorsed by at least two-thirds of the GCU, the policy is submitted to the Department of Education or Ministry of Education (MoE) for final validation. However, the initial draft is made with the absence of faculty, IT experts and students, though faculty feedback represents a degree of bottom-up involvement, the decision-making authority ultimately rests with the university's top management and external regulatory bodies, making it predominately a top-down process with inputs from faculty.



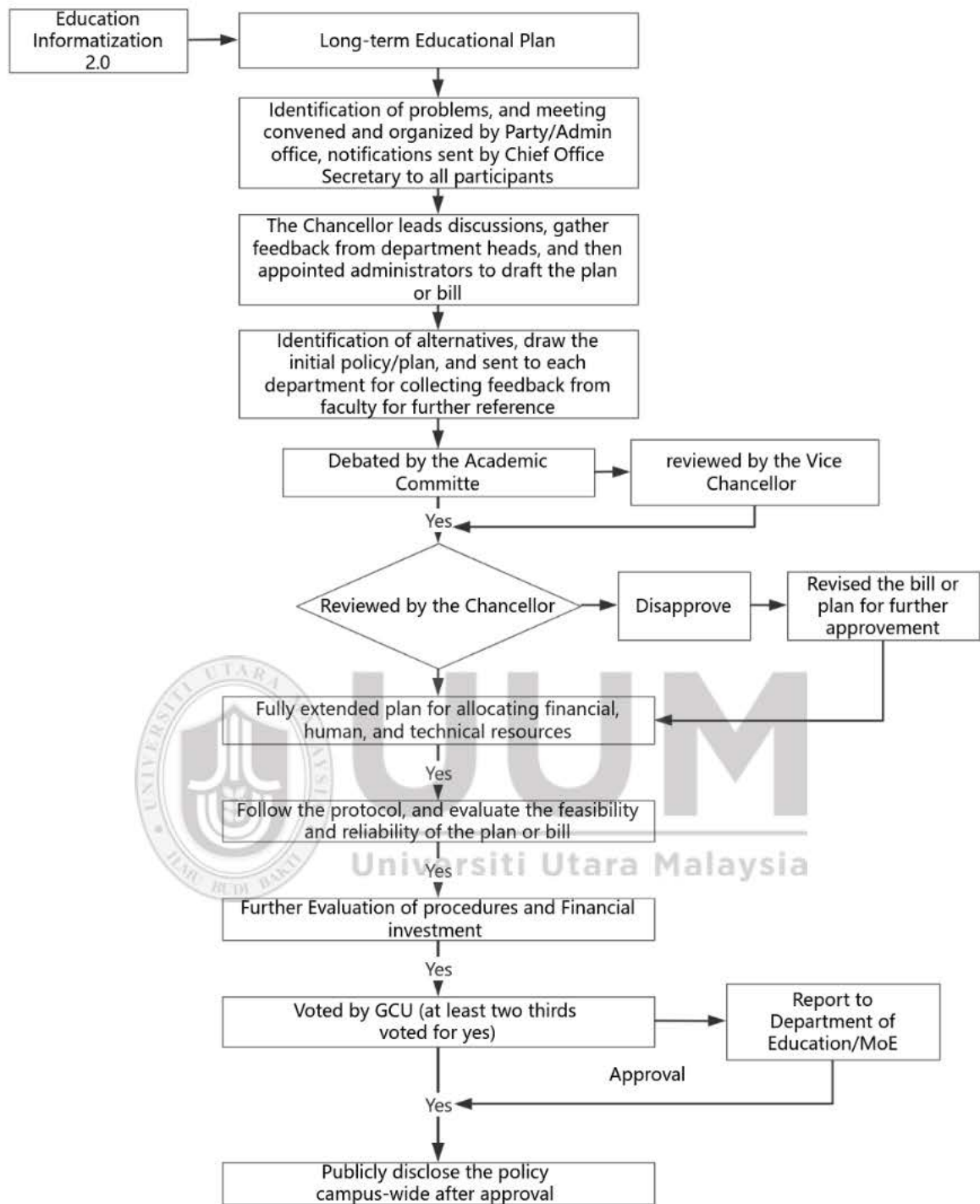


Figure 4.3 University B's policy-making process

The policy-formulation process of University B (See **Figure 4.3**) adopts a top-down approach, which shows that its decision-making authority is centred on top management levels. The Party/Admin Office and Chief Office Secretary first begin identifying problems, convening meetings, and notifying participants. At the same

time, the Chancellor leads discussions, collects thoughts from department heads, and assigns administrators to draft the plan. The Academic Committee then reviews the draft, followed by the appointed Vice Chancellor's evaluation, and the Chancellor's agreement. Once polished, the plan is assessed for the allocation of financial, human, and technical resources, then reviewed and voted on by the GCU. If approved by at least two-thirds of the GCU, the policy is reported to the Department of Education/Ministry of Education (MoE) and publicly disclosed campus-wide. University B is a public university relying on government funding, so any large-scale development plans related to financial grants in digital infrastructure, and e-learning tools should report to the Department of Education or MOE. However, the initial draft is written without the presence of faculty and students, though faculty's perspectives on the initiative draft are collected for further discussion, the final call rests with institutional leadership, ensuring alignment with Education Informatization-2.0.

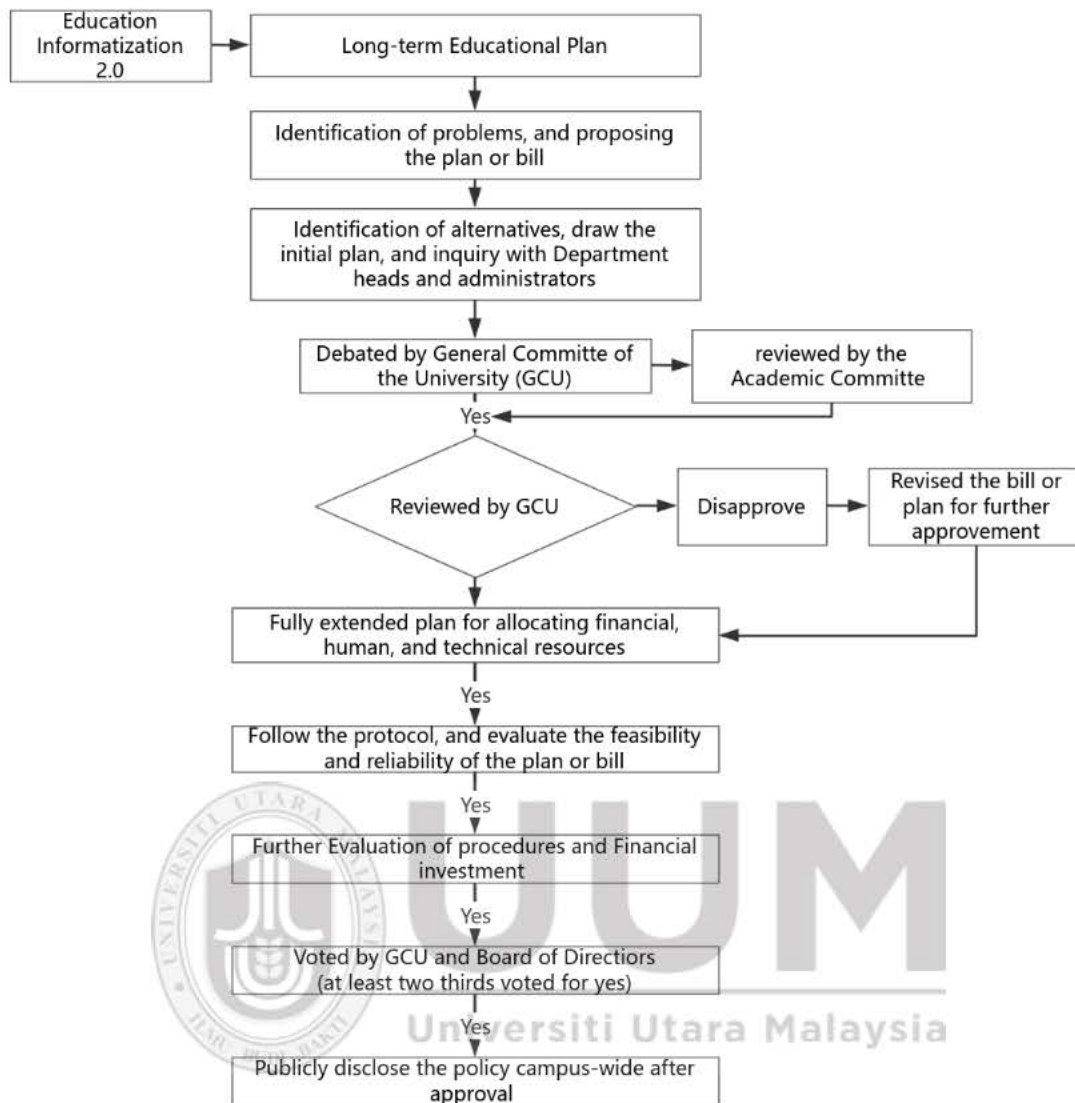


Figure 4.4 University C's policy-making process

When it comes to policy formulating (See **Figure 4.4**), University C deploys a top-down approach, which means that its decision-making authority rests with institutional leadership. Department heads and administrators contribute inputs into problem identification and proposal drafting. Then the GCU and Academic Committee review the plan, with the latter one inputting opinions. If the GCU approves, the plan forwards to the phase of resource allocation, ensuring the viability from financial, human, and technical aspects. In this context, University C is a private university relied on its own financial resources, so it does not need to report to the

Department of Education or MOE. Distinct from public universities A and B, University C’s decision-making authority remains with the Board of Directors. After the joint decision made from the Board of Directors and GCU, the policy is publicly disclosed wide-campus. During the decision-making process, voices from IT specialists, faculty, and students are absent.

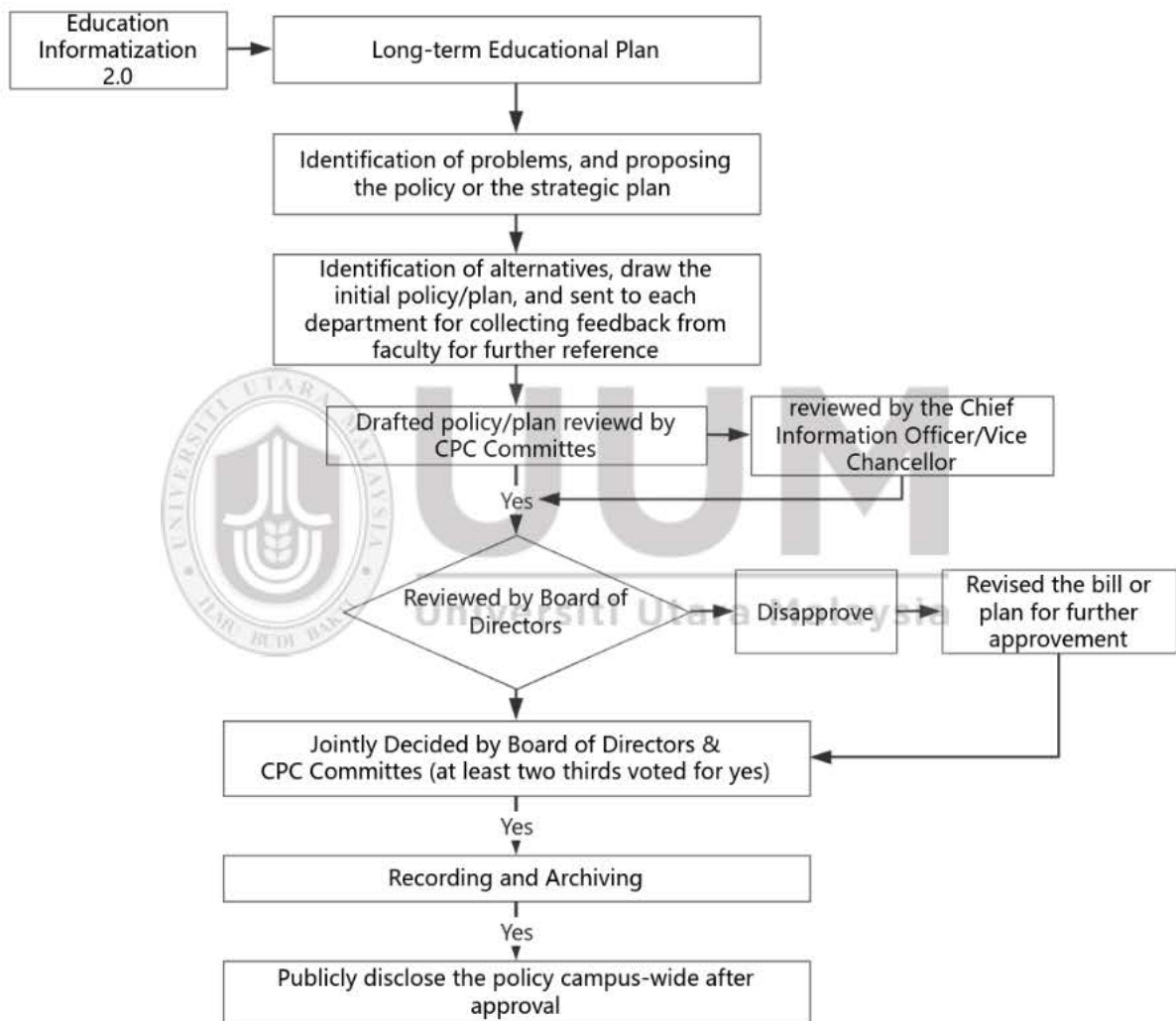


Figure 4.5 University D’s policy-making process

University D employs a top-down approach for policy-formation (See **Figure 4.5**), and its decision-making authority rests with institutional leadership. The first phase starts with problem identification and policy proposing. Ensuring the viability of the plan or policy, CPC Committees and the Chief Information Officer review the drafted

policy and contribute their ideas. After they reach the agreement on the drafted policy, the Board of Directors will evaluate it. Like University C, University D is a private university relied on its own financial resources. The institution has a greater flexibility to pool financial resources and optimize its strength for driving e-learning technologies and upgrading IT infrastructure. In this context, taking feedback from faculty and IT specialists, the large-scale investment plan for procuring e-learning technologies undergoes review by the Division of Network and Education Informatization, and the Division of Network and Education Informatization is responsible for the large-scale investment plan for upgrading IT infrastructure. Requiring a two-thirds of the Board of Directors and CPC Committees voted for yes, the approval is granted. Once granted, the policy is recorded and archived, and then publicly disclosed campus-wide. The presence of CPC Committees implies University D's alignment with party-led governance structures, strengthening the top-down nature for policy-making.

Table 4.4 Comparison of Policy-making process among four universities

Criteria	University A	University B	University C	University D
<b>Top-down Governance</b>	Strong top-down; GCU and Academic Committee oversee policy-making. Final approval by Department of Education/MoE.	Strong top-down; Chancellor, Academic Committee, and GCU control decision-making. Department of Education/MoE approval required.	Strong top-down; Board of Directors and GCU hold full authority over policy decisions.	Strong top-down; Board of Directors and CPC Committees manage policy formulation.
<b>Stakeholder Involvement</b>	Limited; faculty feedback is collected after the drafted policy. No role for IT specialists or students.	Limited; faculty input is gathered post-draft. IT specialists and students are excluded.	Minimal; department heads contribute to problem identification, but faculty, IT specialists, and students are not involved.	Slightly higher; IT specialists and faculty provide input on digital infrastructure investment, but students remain excluded.
<b>Funding Source</b>	Government-funded; financial decisions must align with Department of Education/MoE oversight.	Government-funded; financial decisions must align with Department of Education/MoE oversight.	Self-funded; no external approval needed, allowing financial autonomy.	Self-funded; independent control over finances, with structured input from IT specialists on digital investments.
<b>Financial Flexibility</b>	Low; constrained by government regulations and approval processes.	Low; constrained by government regulations and approval processes.	High; greater autonomy in budget allocation and strategic investments.	High; independent financial management with some participatory elements in IT infrastructure planning.

Source: Author's own work

All four academic HEIs deploy a top-down structure (See Table 4.4), which means their decision-making authority rest with institutional leadership. Variations, however, display in four areas, which are stakeholder involvement, financial autonomy, and flexibility in investment plan on e-learning tools and infrastructure. Public academic HEIs, Universities A and B, need to get their large-scale financial investment granted from Department of Education or MoE. In these two universities, IT specialists and students are not involved in the decision-making process, reinforcing centralized control over policy-making process.

On the other hand, private academic HEIs, Universities C and D, possess greater

financial independence in investment decisions. Policy-making process of University C is top-down-oriented, and its decision-making authority rests with the Board of Directors and GCU. Faculty, IT specialists, and students are not involved in the process. University D, which also adopts a top-down structure, will seek IT specialists' idea for upgrading IT infrastructure, and also enquiry with faculty's perspective on the selection of e-learning tools. This limited participation of faculty and IT specialists distinguishes University D from University C.

### **4.3 Discourses Analysis of Education Informatization 2.0**

In this section, the documentation of Education Informatization 2.0 will be analyzed using CDA, providing an in-depth insights into how the policy portrays education modernization through digital transformation. Also this section will enrich our understanding of discourses related to institutional autonomy, financial support, public-private partnership, and institutional leadership embedded in the policy text.

#### **4.3.1 CDA of Education Informatization 2.0**

##### **4.3.1.1 Discursive analysis**

The data suggests that Education Informatization 2.0 leans heavily toward Technological Determinism. To establish the dominance of this deterministic outlook, the research pinpointed recurring themes and underlying assumptions that closely align with this perspective.

- *Transformation and Modernization of Education*


- *Universal Access and Equity*
- *Systematic Integration of IT*
- *Skill Development-digital literacy and Pedagogical skills*
- *Technology Optimism*
- *Inevitability of Technological Progress*
- *Need for Strategic Implementation*
- *Sustainability and Continuous Improvement*

### *Transformation and Modernization of Education*

Policy statements on the Transformation and Modernization of Education sketch out a future in which technology takes center stage. Digital infrastructure, smart technologies, and data-driven governance are framed as the bedrock of progress, with language like “ensure” (Extract 2 & 5, Appendix E & F), “promote”(Extract 1, Appendix E & F), and “equip” (Extract 1, Appendix F) injecting a sense of urgency—suggesting that technological integration is not just necessary but inevitable. The vision of smart education leans heavily on AI, virtual reality, and intelligent learning environments, presenting these innovations as self-evident drivers of pedagogical change. This technocratic optimism, however, risks downplaying the role of faculty and the complexities of human learning.

Digital literacy, meanwhile, is positioned as a core competency, with large-scale assessments and standardized training shaping policy priorities. While this approach is essential, it often treats digital literacy as a technical skill rather than a means of

fostering critical engagement with the ethical and socio-cultural dimensions of technology. At the same time, data-driven decision-making and IT governance are elevated as central pillars of reform. Systematic data collection and big data analytics promise greater efficiency, reinforcing a policy environment where quantifiable outcomes take precedence. While this enhances administrative control, it risks marginalizing qualitative insights and pushing education further into a performance-driven model where metrics trump holistic development. Taken together, these discourses paint a picture of modernization largely defined by technological advancement—often at the expense of deeper pedagogical, ethical, and social considerations.



*Universal Access and Equity*

The policy prioritizes universal access and equity in Education Informatization 2.0, expanding online courses, digital literacy programs, resource-sharing platforms, AI-driven learning, infrastructure, financial support, and international cooperation. While ambitious, it reflects tensions between central control, technological optimism, and practical challenges.

The push for online courses, framed by terms like “develop” (Extract 1, Appendix E), “promote,” (Extract 1, Appendix E & F) and “high-quality” (Extract 1, Appendix A & G), underscores state-led oversight. This ensures consistency but may limit pedagogical diversity. Digital literacy is treated as a standardized skill, with

“e-readiness” and “faculty training”(Extract 2, Appendix E) emphasizing technical competence over critical engagement with digital systems. The risk is a narrow, procedural approach that overlooks broader social and ethical implications.

Collaboration is encouraged through “resource-sharing platforms” and “collaborative development” (Extract 1, Appendix E), fostering institutional partnerships but raising concerns about intellectual property and adaptability. Infrastructure investments in “broadband connectivity” and “smart devices” (Extract 1, Appendix F) assume technology alone can close the digital divide. Without ongoing support for training and maintenance, disparities could persist. Similarly, AI-driven learning tools are promoted as transformative, yet the focus on “personalized and adaptive learning” (Extract 2, Appendix F) overlooks biases and inconsistent implementation across institutions.

Financially, “diversified investment” and “government-market partnerships” (Extract 2, Appendix H) reflect a pragmatic funding model. However, underfunded educational institutions risk lagging behind without tailored approaches to address regional gaps. Internationally, China positions itself as a contributor and a leader in education informatization through “international outreach,” “partnerships,” and “knowledge exchange” (Extract 4, Appendix H). This strengthens influence but creates tension between open collaboration and national strategic priorities.

### *Systematic Integration of IT*

Education Informatization 2.0 foresees a future where IT infrastructure, AI, and data governance seamlessly integrate into the fabric of higher education. The repetitive use of “smart campuses,” “resource platforms,” and “AI-driven environments” signals a firm belief in technology’s ability to optimize learning and streamline administration. According to government guidelines, educational institutions are supposed to pool their resources into centralized platforms that promise efficiency but run the risk of restricting innovative teaching practices. Although the move towards data-driven decision-making is framed as a neutral and pragmatic step forward, the sheer volume of systematic data collecting creates uneasy concerns over privacy, surveillance, and institutional autonomy. Likewise, while cybersecurity is positioned as a governance imperative, its close adherence to national security regulations suggests that digital education is beyond upgrading classrooms; it’s also about injecting government regulations into the academic realm.

Beneath the polished rhetoric of technological progress, the policy reveals tensions between centralization and flexibility, standardization and academic freedom. The fever for AI-driven teaching and intelligent learning tools reflects an unwavering belief in technology’s ability to customize education to individual students, but it glosses over practical concerns—bias in AI algorithms, unequal access to resources, and the risk of faculty becoming mere operators of pre-programmed e-learning tools. Although investment in smart education zones and next-generation technologies is

meant to propel China to the forefront of global education, the risk of deepening regional disparities remains high in the absence of clear plans for uneven distribution of support and resources. Positioning IT as the cornerstone of Education Informatization 2.0, the policy casts technology as savior and overseer—one that promises future development but operates firmly within the contours of state control.

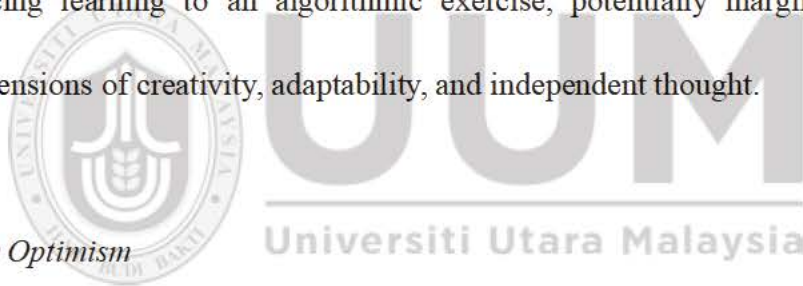
### *Skill Development-digital literacy and Pedagogical skills*

Skill development in Chinese higher education is increasingly framed through a technologically optimistic lens, where e-learning is positioned as a vehicle for transformation. The policy's emphasis on "national high-quality online open courses" and "innovative digital content" reflects a belief that integrating advanced technology into pedagogy is not just beneficial but necessary. This faith in technology extends to the development of digital literacy, where pragmatic concerns drive efforts to embed "large-scale assessments" and standardized training into curricula. The push for faculty development further underscores the state's intent to create an adaptable workforce, though it runs the risks of favoring strict, test-driven approaches over more nuanced, critical engagements with e-learning tools. Meanwhile, the corporatist framing of e-learning environments indicates a move towards participatory, tech-enabled learning models, with "interactive platforms" and "virtual labs" reinforcing hands-on, industry-aligned skill acquisition.

Yet, under Education Informatization 2.0, skill development is not merely a matter of

pedagogy—it is also a product of technocratic governance and data-driven legitimacy. The establishment of “smart education demonstration zones” and the deployment of AI, IoT, and blockchain in curriculum development suggests an inevitable shift to technology as the dominant force shaping teaching strategies. Data collection and analytics further solidify this approach, positioning “big data in education” as a key metric for tracking progress and shaping administrative efficiency. The policy envisions an education system that is highly quantifiable, where skill development is monitored, refined, and optimized through systematic oversight. While this increases responsibility and guarantees consistency with national economic objectives, it also risks reducing learning to an algorithmic exercise, potentially marginalizing the human dimensions of creativity, adaptability, and independent thought.

*Technology Optimism*



Technology is cast as the great equalizer in China’s vision of education modernization, a force that will reshape post-secondary education and drive national progress. Education Informatization is positioned as the cornerstone of modernization, without which progress is deemed impossible. The sweeping reforms laid out in policy documents paint a future where smart classrooms, AI-driven learning, and data-powered governance become the bedrock of education. Terms like “intelligent teaching support,” “next-generation educational technologies,” and “systematic data collection” are deployed with strong confidence, reinforcing the idea that technological advancement is not just desirable but inevitable. The optimism is

palpable: AI will optimize student engagement, e-learning platforms will democratize knowledge, and data analytics will streamline decision-making. The promise is grand.

This promise, however, in Education informatization 2.0 overlooks its complexities. Portraying technology as an inherently transformative force, the policy marginalize the realities of e-learning practices—unequal access to IT infrastructure, the challenges of maintaining engagement in online and hybrid learning, and the dangers of narrowing education to a collection of quantifiable metrics. The insistence on data-driven decision-making assumes that learning can be neatly measured, disregarding the less tangible but equally vital aspects of education, such as critical thinking and creativity. In a similar vein, the idea that AI, IoT, and block-chain will enhance pedagogy calls into a question how faculty can create interactive learning environments. While the narrative of informatization as a national imperative aligns with China's broader ambition of digital supremacy, it also reflects a global techno-utopian discourse—one that celebrates the potential of e-learning tools while often downplaying the structural, pedagogical, and ethical challenges they bring.

### *Inevitability of Technological Progress*

E-learning technologies, incorporated into teaching and learning, served beyond just as tools—they are also an inevitable force reshaping educational activities at all levels. The drive for national online courses, smart classrooms, and big data decision-making is considered as a automatic process, one that will sweep aside constraints of time,

space, and institutional change. Smart education zones, intelligent teaching environments, and virtual reality-enhanced curricula are positioned as indisputable improvements, their pros assumed rather than debated. According to the policy, informatization is the key to modernization, as though resisting Education Informatization is akin to denying the passage of time. In this vision, technological advancement is a inevitable while transforming teaching and learning.

Yet, underlying this assumption, tensions remain unspoken. To embrace AI and data-driven governance in universities states that efficiency and catering to various learners' needs can be improved through algorithms, marginalizing questions about equity, ethics, and the limits of pedagogical use of IT. The promise of e-learning environments and integration of e-learning technologies overlooks the realities of uneven access, the persistence of physical teaching values, and the complexities of student engagement. While the policy views technology as the indisputable solution to education's challenges, it downplays the need for critical reflection on its implications.

#### *Need for Strategic Implementation*

The policy underscores the strategic necessity of standardization, investment in IT infrastructure and e-learning tools, faculty training, and AI-driven governance. Discourses like “First-class online courses” and “rigorous evaluation standards” reinforce a bureaucratic vision of e-learning, where structured oversight ensures

alignment with domestic and international benchmarks. Faculty training, too, used as a means to address resistance from inadequate digital literacy, with large-scale training initiatives positioning faculty as agents of change while subtly implying a deficiency in their current skills. Similarly, the emphasis on broadband access, smart classrooms, and smart campus constructs IT infrastructure as the cornerstone for modern education, suggesting that technological advancement precedes pedagogical innovation. These discourses reflect a broader state-led approach in which investment in IT infrastructure and e-learning tools precede pedagogical change—an assumption that risks underestimating the complex nature of technologies and evolving education landscape, particularly in under-resourced institutions.

*Sustainability and Continuous Improvement*

The policy positioned Education Informatization 2.0 as an ongoing process rather than a final product, requiring constant updates and improvements. It highlights national online courses, faculty and student training, and planned IT infrastructure upgrades as key to long-term sustainability. By treating digital literacy as an ongoing need and online courses as ever-evolving, the policy aligns education with China's broader modernization efforts, where continuous improvements drive progress. To support this vision, the policy promotes systematic data collection, AI-driven decision-making, and cloud-based administration, optimizing education through an industrial process.

#### 4.3.1.2 Policy text analysis

There are three parts in this section. Firstly, raw text from Education Informatization 2.0 will be sorted out. Secondly, a table will be used to display the analysis of Appendix. Final part is a discussion over text analysis of Education Informatization 2.0. Thompson (2004) asserts that analyzing data through tables reveals the relationships between discursive forms at the micro level and the reinforcement or alteration of power dynamics at the macro level. In the policy framework of Education Informatization 2.0, two policy text will be analyzed in the following:

- *Pedagogical and Technological Requirements*
- *Goals, Significance, and Challenges & Support*

Table 4.5 Pedagogical and Technological Requirements

NO.	Pedagogical and Technological Requirements	Micro	Linkage	Macro
		Delineation (Text Analysis)	Interpretation (Discursive Types)	Explanation (Social Practice)
1	Develop and integrate digital educational resource platforms that provide teachers and students with access to a wide array of learning materials and tools.	"Digital Resource Integration" refers to the systematic approach to consolidating digital educational resources.	Technocracy (DT1)	Highlighting a structured and technologically driven method of managing educational content.
2	Implement rigorous evaluation standards and recognition systems for high-quality courses to ensure they meet national and international educational standards.	"Quality Assessment and Recognition" is on the process of evaluating and acknowledging the quality of online courses.	Neutrality(DT3)	Using a neutral and objective tone.
3	Establish platforms for sharing high-quality educational resources, including courses and teaching materials, across higher education institutions.	"Resource Sharing Platforms" shows a corporatist integration of resources and capabilities across the educational sector.	Corporatism (DT4) Pragmatism(DT6)	Demonstrates a practical strategy for maximizing the utilization of available learning materials across institutions.
4	Collaborative Development: Encourage collaboration among universities to develop and share high-quality courses that leverage each institution's strengths.	"Collaborative Development" highlights the cooperative efforts among universities to develop and share high-quality courses.	Corporatism (DT4)	Demonstrating a corporatist approach by integrating resources and expertise from various institutions.
5	Broadband Connectivity: Ensure that every school is	"Ensure that every school is connected to the internet"		

	connected to the internet with adequate bandwidth to meet the needs of information technology-based teaching.	conveys a strong commitment and confidence in the government's capability to achieve widespread internet connectivity in schools. Confidence (TG1)		
6	Identify and promote exemplary First-class courses in higher education to set benchmarks and encourage widespread adoption of best practices.	"Set benchmarks and encourage widespread adoption of best practices" signals confidence in the ability to establish standards that will lead to broad improvements in educational practices. Confidence (TG1) Persuasion (TG4)		
7	Assessment of Students' e-readiness: Development of Evaluation Systems: Create a comprehensive system to evaluate and assess the information literacy of students.	"Assessment of Students' e-readiness" refers to a systematic evaluation of students' readiness for e-learning, framed in a neutral, factual manner.	Neutrality(DT3)	
8	Focus on cultivating information literacy among students as a fundamental quality, preparing them for the demands of the digital age.	"Information literacy as a fundamental quality" underscores the belief that equipping students with tech-related skills is essential for their success in the digital age.	Technology Optimism (DT5)	
9	Establish over ten smart education demonstration zones in strategically important and technologically advanced areas to pilot innovative educational practices.	"Smart Education Zones" indicates a strategic initiative to establish designated areas for implementing advanced educational technologies.  "Strategically important and technologically advanced areas" conveys a confident approach to placing these zones in locations that will maximize their impact and effectiveness.	Pragmatism(DT6)  Pragmatism(DT6)	It emphasizes the government's focus on using technological innovations as a solution to educational challenges.
10	Develop AI-driven environments that support personalized and adaptive learning for students, enhancing engagement and educational outcomes.	"Intelligent Teaching Support" to support personalized learning points to a high-tech approach to educational challenges.	Technocracy (DT1)	Using sophisticated technology to tailor education to individual needs
11	Implement cutting-edge technologies such as artificial intelligence (AI), Internet of Things (IoT), and blockchain to transform educational methodologies and infrastructures.	"Next-Generation Educational Technologies" reflects the forward-thinking and innovation-driven approach of the policy.	Technocracy (DT1) Technology Optimism (DT5)	Focusing on cutting-edge technologies such as AI, IoT, and blockchain to revolutionize educational methods.
12	Build smart classrooms that integrate advanced digital tools to facilitate interactive and immersive learning experiences.	"Smart Classrooms" suggests a belief in the efficacy of digital tools to enhance the learning environment and interaction within classrooms.	Technology Optimism (DT5)	

13	Integrate AI and other smart technologies into curriculum development to provide dynamic and responsive educational content.	"AI in Curriculum Development" reflects optimism about technology's ability to dynamically adapt and enrich educational content.	Technology Optimism (DT5)	
14	Employ advanced technologies like cloud computing and big data to support and enhance educational administration, decision-making, and public services.	"Data-Driven Decision-making" underscores the reliance on quantitative data and analytical techniques to inform and enhance educational administration and policy-making.	Technocracy (DT1) Pragmatism(DT6)  Neutrality(DT3)	It shows characteristic of a neutral discourse that relies on data rather than subjective judgment.
15	Enhance the management level of education through optimized management information systems and deepened application of big data in education.	"Policy and Regulation" in the context of enhancing the management level of education through optimized management information systems emphasizes adherence to formal and legal frameworks.	Legitimacy (DT2)	Underscoring the legitimacy of the initiatives described.

Source: Author's own work

Table 4.6 Goals, Significance, and Challenges & Support

NO.	Goals, Significance, and Challenges & Support	Micro Delineation (Text Analysis)	Linkage Interpretation (Discursive Types)	Macro Explanation (Social Practice)
1	The Education Informatization 2.0 Action Plan marks a pivotal moment in harnessing the transformative power of IT within the education sector.	"Transformative power of IT within the education sector" embodies technological optimism by highlighting information technology as a pivotal force capable of reshaping educational practices and outcomes.  "Harnessing the transformative power of IT" persuades the audience of the significant impact that information technology can have on education. Persuasion (TG4)	Technology Optimism (DT5)	Suggesting that it is not only beneficial but essential for modernization.
2	After years of trial and refinement, the revolutionary potential of technology in education has begun to take shape.	"Revolutionary potential of technology" expresses a high level of certainty and optimism about the role of technology in transforming education. Confidence (TG1)		Indicating a strong belief in its positive impact.
3	Forming a central pillar of the 'Education Modernization 2035' agenda.	"Educational Modernization 2035" refers to a long-term strategic goal, aligning the informatization initiative with broader, officially sanctioned educational reform goals.	Legitimacy (DT2)	Legitimizing the initiative within a formal and recognized policy framework.
4	Education informatization offers unparalleled advantages: it removes the traditional constraints of time	"Unparalleled advantages" signifies the benefits of education informatization as unparalleled. Confidence (TG1)		Communicates a strong confidence in the unique and superior benefits of the proposed changes.

	and space, enables rapid dissemination and replication of information, and supports diverse modes of presentation.			
5	These capabilities will undoubtedly serve as key enablers of educational equity and quality.	"Educational equity and quality" employed to convince the audience that informatization will directly contribute to fairness and excellence in education. Persuasion (TG4)		Appealing to values that are widely held as important in the educational community.
6	By leveraging informatization as the cornerstone of educational modernization, China is making a strategic move that carries profound implications for becoming a global leading role and a highly skilled workforce.	"Strategic move" used to persuade the audience that the actions being taken are not only practical but are carefully planned strategic decisions. Persuasion (TG4)		Aimed at positioning China as a leader in global education.
7	The Education Informatization 2.0 Action Plan is set to achieve... the universal provision of e-learning tools to faculty.	"Universal provision of e-learning tools" is neutral and factual.	Neutrality(DT3)	Focusing on the objective of making e-learning tools widely available without expressing a subjective viewpoint or emotional undertone.
8	The Ministry of Education plays a central role in formulating overarching policies, guiding education reform at all levels, and addressing regional disparities in development.	"Ministry of Education" establishes authority and lends legitimacy to the policy actions described in the document.	Legitimacy (DT2)	
9	Systematic evaluations, including third-party assessments, will be conducted to improve the efficiency, effectiveness, and impact of educational digitalisation across different regions and institutions.	"Systematic evaluations" indicates a structured, methodical approach to assessing the effectiveness and impact of digitalization initiatives.	Legitimacy (DT2)  Pragmatism(DT6)	Not only provides a basis for legitimacy through transparency but also aligns with bureaucratic processes.  Assessing the effectiveness of e-learning implementations, aiming to ensure they achieve desired outcomes.
10	Innovative Mechanisms and Diversified Investment: Policy environments should foster investment from enterprises, enabling them to provide high-quality digital products and services.	"Innovative Mechanisms and Diversified Investment" refers to the policy environments that foster investment from enterprises. "Foster investment from enterprises" encourages enterprise investment in educational informatization, which suggests a public-private partnership approach.	Corporatism (DT4)  Corporatism (DT4)	Integrating corporate support with government initiatives in the education sector.  Aligning government goals with private sector capabilities and resources.
11	China will continue to collaborate with and actively participate in the educational informatization initiatives of	"Open Collaboration and International Outreach" Emphasizes global cooperation and collaboration with	Corporatism (DT4)	Showcasing a corporatist approach by including multiple international stakeholders in the

	international organisations such as UNESCO and UNICEF.	international organizations and educational institutions.		educational modernization process.
12	Large-scale training programmes will be implemented for teachers, school leaders, and administrators at all levels, with innovative approaches to enhance their effectiveness.	"Large-scale training programmes" reflects a practical approach to improving the skills of educators and administrators.	Pragmatism(DT6)	Focusing on widespread and effective training to ensure the successful adoption of digital tools.
13	A pilot-first approach will be maintained, with targeted regional and specialised digitalisation trials leading the way.	"Pilot-first approach" emphasizes testing policies in specific contexts before wider implementation.	Pragmatism(DT6)	It is a hallmark of pragmatic policy development.
14	Legal frameworks such as the Cybersecurity Law will guide the development of a strong cybersecurity infrastructure within the education sector.	"Cybersecurity Law" cites specific legal frameworks to legitimize the digitalization efforts by aligning them with legal standards and requirements.	Legitimacy (DT2)	Demonstrating compliance with national security protocols.

Source: Author's own work

#### 4.3.1.3 Discussion on the text of Pedagogical and Technological Requirements

The technological discourses (See Table 4.5) in the policy document of Education Informatization 2.0 position technological advancements as the pillar of educational reform. Terms such as “Smart Education Zones” (NO.9, Test 1), “Next-Generation Educational Technologies” (NO.11, Test 1), and “Digital Resource Integration” (NO.1, Test 1) underscore a language where innovation is framed as both a necessity and a solution to educational challenges. The policy envisions education as an industrialized process, optimized through AI-driven decision-making, cloud computing, and big data analytics. By integrating “Intelligent Teaching Support” (NO.10, Test 1) and “Smart Classrooms” (NO.12, Test 1), the discourse, assertive and formal, promotes a vision of seamless technology-enhanced learning environments, strengthening the idea that progress in education is closely linked to advancements in digital infrastructure.

The discourses related to pedagogy in Education Informatization 2.0 are

“Collaborative Development” (NO.4, Test 1) and “Quality Assessment and Recognition” (NO.2, Test 1), which constitute a structured approach to pedagogy that values pooled knowledge and rigorous evaluation. The focus on “Information Literacy as a Fundamental Quality” (NO.8, Test 1) and “Assessment of Students’ e-Readiness” (NO.7, Test 1) underlines the role of digital literacy as a core indicator of faculty’s and students’ preparedness for online and hybrid teaching and learning. Additionally, AI-driven curriculum development and the setting of pedagogical benchmarks mark a shift toward a dynamic, data-informed educational model that prioritizes continuous improvement.

#### **4.3.1.4 Discussion on the text of Goals, Significance, and Challenges & Support**

The language (See Table 4.6) used in text 2 draws from a range of nascent terms such as ‘revolutionary potential of technology’(NO.2, Test 2), ‘education modernization 2035’(NO.3, Test 2), and ‘global leading role’ (NO.6, Test 2). These phrases are indicative of forward-looking discourses. The text stresses the importance of adopting Education Informatization 2.0 initiatives for addressing educational change. Change is identified in words like ‘form’, ‘shape’, and ‘leverage’. The policy text 2 is constituted with a strong focus on technocratic and legitimacy discourses.

Yet, although the policy outlines broad objectives, clarity and concreteness are absent across various sections. In Extract 1 (Appendix G), main challenges are highlighted. For instance, it states that faculty digital literacy remain basic and their pedagogical

innovation is constrained, but it does not specify how these issues will be resolved beyond general statement of training programs. The phrase “the gap between current status and the requirements remains substantial” is an example of technological optimism, recognizing e-learning shortcomings but indicating an inevitable, forward-moving transformation without fully detailing how these gaps will be closed. In Extract 2 (Appendix H), funding strategies, including governmental and market-driven approaches, are discussed, yet remain non-specific related to how investment will be distributed and allocated across different regions and educational institutions.

#### **4.3.2 Discourses Analysis of Education Informatization 2.0**

As what have been discussed in the section 2.3.3 of Literature Review Chapter, institutional autonomy, financial support, public-private partnership, and institutional leadership are critical when reaching a balance between catering to institution-tailored needs and aligning with the objectives of macro-level policy. This section aims to analyze discourses related to these factors and explore how the policy text linguistically and structurally addresses these factors.

##### **4.3.2.1 Institutional Autonomy**

Universities' autonomy in implementing e-learning policies is shaped by a top-down yet adaptable framework, as seen in the linguistic features of national policy extracts.

The use of strong modal verbs such as "ensure" and "promote" is indicative of an

adaptive approach, which prioritizes the benchmark for outcomes but do not impose rigid procedures. Using passive sentences without mentioning who is responsible hides accountability. This strengthens the influence of national policies while making institutional decision-making visible in universities. For example, phrases like "Ensure that every school is connected to the internet" and "Provide ongoing training for faculty" (Appendix F) suggest that overarching policies provides a broad direction but leaves rooms for universities to choose flexible methods to reach these two goals. Content analysis of the extracts further reveals a controlled form of institutional flexibility. While universities are encouraged to innovate pedagogical use of technologies, beyond the focus of Education Informatization 2.0 on developing "national high-quality online open courses" (Appendix E), they can integrate IT into teaching and learning with alternative means in their contexts. Collaborative initiatives, such as the directive to "develop and share high-quality online courses," reflect a form of regulated autonomy that maintains uniformity across institutions. Although universities have some flexibility, their autonomy is highly regulated and structured by national policies. They must align with the central directives of Education Informatization 2.0 while mapping institution-specific solutions. This balance reflects a system where autonomy is permitted only within a framework that aligns with national objectives, reinforcing centralized influence over institutional decision-making.

#### **4.3.2.2 Funding Strategies**

The language related to financial support is embedded in Education Informatization 2.0 (Appendix H). The section details financial resources in two forms, direct government funding for technology procurement and a strategic call for diversified investment including state-owned and private organizations. The language clarifies financial support as critical for achieving the goals established in Education Informatization 2.0, centering on the necessity of these resources in enabling the deployment and effective use of e-learning technologies. The policy text not only acknowledges the need for financial support but actively frames it as an essential component of the educational modernization strategy, integrating it with broader technological and educational transformations. However, discourses relate to lack of funding are absent in Education Informatization 2.0. Outlining a strategic call for diversified funds raised from the public and private sectors, this approach overlooks potential criticisms of insufficient funding.

#### **4.3.2.3 Public-Private Partnership**

Addressing disparities and steering efforts of Education Informatization 2.0 (Extract 1, Appendix H), The Ministry of Education China, MOE, serves as the engine of educational reforms. Educational institutions take initiatives to achieve the targets established by Education Informatization 2.0. The directive to integrate e-learning technologies and adhere to national standards (Extract 2, Appendix H) highlights their critical roles in translating the strategic objectives of the policy into practice.

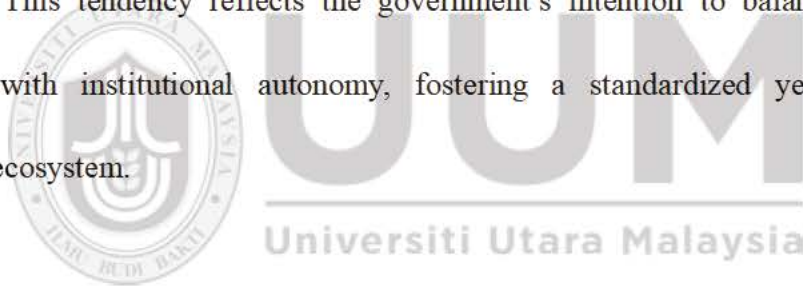
Meanwhile, the private sector contributes to the investment in e-learning initiatives, fostering a public-private partnership. This collaboration has been mentioned in Extract 2, Appendix H. Additionally, facilitating global cooperation and knowledge exchange, Education Informatization 2.0 has brought UNESCO and UNICEF to attention.

Discourses in Education Informatization 2.0 indicates that public-private partnership is central to achieving the goals of Educational Informatization 2.0. The policy text emphasizes the significance of collaboration. The government acts as the coordinator, educational institutions take initiatives to upgrade e-learning technologies and infrastructure, the private sector contributes through investment and innovation, and international organizations support knowledge sharing. This public-private partnership reflects a macro-level strategy that pools diverse expertise and resources to harness the power of e-learning technologies.

#### **4.3.2.4 Institutional Leadership**

The discourses in Education Informatization 2.0 are indicative of a structured approach to institutional leadership for facilitating e-learning. These discourses position institutional leaders as central figures in achieving strategic objectives of Education Informatization 2.0. These institutional leaders, underlined as Chief Information Officers (CIOs), are responsible for crafting e-learning strategies, protecting data privacy and security, and driving the digital transformation. Words,

"ensure" and "adopt", underscore the compulsory nature of their responsibilities, strengthen the alignment of institutional plans with Education Informatization 2.0. On the other hand, the discourses in Education Informatization 2.0 are indicative of the necessity for systematic evaluation, requiring third-party organizations to evaluate the performance of e-learning initiatives. These discourses show that institutional leaders should endorse national standards while simultaneously fostering innovation. E-learning initiatives are considered as a critical success factor of macro-level strategy in Education Informatization 2.0. The discourses in Education Informatization 2.0 give institutional leadership credits in driving e-learning initiatives. This tendency reflects the government's intention to balance national directives with institutional autonomy, fostering a standardized yet adaptable e-learning ecosystem.



#### **4.4 CDA of institutional e-learning policies at universities**

As previous sections introduced the current state of e-learning policies at universities A, B, C, and D, this section further explores how policy texts inform the role of e-learning technologies in teaching and learning and illustrates the findings of a CDA of e-learning policy texts in these universities. In addition, this section adds value not just to understanding policy texts and the discursive discourses, but also to comprehending the social context in which these policies were crafted. The findings reveals the discursive power relations that are developed among various text types and discursive genres found in the policy scripts.

#### 4.4.1 CDA of institutional e-learning policies at university A

##### 4.4.1.1 Discursive analysis

Findings from interpreting data indicated that e-learning policies at university A is most closely aligned with Technological Determinism. To prove that deterministic discourse is predominated, the research identified common themes and assumptions highly associated with Technological Determinism. Institutional e-learning policies at university A contains three ideological assumptions on the role of e-learning technologies:

- *Technocentrism*
- *Efficiency and Management Focus*
- *Economic Rationalism*



##### *Technocentrism*

The policy highlights several key initiatives designed to embrace technological advancement, focusing on expanding the campus network for improved access and speeds, optimizing the "Today on Campus" app for streamlined administration (Extract 2, Appendix A), and developing a big data center for better cross-departmental management (Extract 2, Appendix A). Security is emphasized through investments in online platforms to safeguard digital infrastructure (Extract 10, Appendix A). The university also adapts its pedagogy, promoting "Internet + Higher Education" to advance online courses, blended learning, and flipped classrooms,

aiming to improve engagement and learning outcomes (Extract 3, Appendix A). In this case, technological advancement is considered as an inevitable trend rather than a strategic choice.

However, the policy, which adopts a techno-centric approach, overlooks critical issues about how technology impacts the broader philosophy of education. It assumes that with technological advancement of network facilities, big data center, and online platforms, blending learning and flipped classroom teaching methods will universally enhance engagement. Yet, it fails to address the readiness of faculty and students to implement these methods effectively, nor does it critically evaluate which LMS platform is suited for supporting hybrid learning approaches (Extract 9, Appendix A), and it also fails to specify other alternative pedagogy might also fit the needs of faculty and students utilizing these technologies in teaching and learning. Not all faculty members may be equipped to implement hybrid learning approaches, and some students may lack the digital literacy or access to benefit fully from these technologies.

This raises unanswered questions: How will the university ensure that faculty and students are adequately prepared? What steps will be taken to assess their readiness, and how will choosing appropriate LMS platforms be handled? The policy's priorities—networked facilities, digital platforms, and adoption of innovative pedagogy—take precedence over these critical issues of preparedness and

appropriateness. By focusing narrowly on technological advancement as the key to effective e-learning, the policy misses the larger conversation about how to ensure its effective integration into the educational experience.

### *Efficiency and Management Focus*

The strategic focus of University A's policy reflects a first-choice of administrative efficiency through the integration of technology, rather than a transformative shift in pedagogical practices. Significant investments, such as expanding the campus network, developing applications like "Today on Campus," and constructing a big data center (Extract 2, Appendix A), are designed to optimize administrative processes, streamline resource allocation, and improve decision-making. These initiatives ensure that digital tools are primarily used to enhance operational efficiency, enabling smoother administrative functions and more effective management of resources.

However, the policy places less emphasis on how technology can innovate or deepen teaching and learning processes. While these digital advancements support the efficient delivery of education, there is limited exploration of how they could foster more dynamic, creative, or collaborative pedagogical approaches. This strategic movement suggests a focus on control and surveillance—tracking student performance and improving operational functions—rather than fostering pedagogical innovation.

In brief, University A's approach reflects strategic priorities that value management and oversight over more transformative educational possibilities, aligning with a broader trend of using ICT to enhance administrative functions and measurable outcomes. While these advancements improve operational efficiency and prepare the university for future challenges, they might not fully address the potential for ICT to revolutionize the learning experience itself.

### *Economic Rationalism*

University A's policy demonstrates a clear commitment to economic rationalism, focusing on resource optimization in administrative and educational operations. The policy highlight is its focus on financial prudence (Extract 11, Appendix A). The university's strict budget approval processes for e-learning projects provides a method to optimize the allocation of financial resources, aligning with both internal priorities and external funding standards. The development of the "Today on Campus" application and other online platforms (Extract 2, Appendix A) demonstrates a tendency to restructure operational costs. Minimizing the need for physical administrative services, the university could allocate resources more effectively while improving service delivery. Similarly, the investment in big data and enhanced information systems could rationalize the use of resources by aiming for long-term sustainability through improved efficiency and reduced redundancy in administrative operations.

Yet, the policy may fail to consider potential risks of heavy digital reliance and stringent financial control. Although the discourse is in favour of Technology Determinism, it overlooks issues such as technological obsolescence and the digital divide among students. Furthermore, the policy's stringent financial oversight and control may stifle innovation. The strict budget protocols outlined in the policy indicated its financial prudence, but this cautiousness could delay necessary advancements in e-learning. By prioritizing financial control over flexibility, the policy risks constraining creative or experimental approaches that could be crucial for responding to rapidly evolving educational needs.

Unanswered questions rise: How will the university address the risk of technological obsolescence? How will the university ensure equitable access to digital tools and online learning opportunities for all students? Can financial control measures be balanced with the need for innovation? Answering above questions, the policy may specify a balanced approach and guidelines to corresponding to the need for coping with the risk, fairness and equitable access, and innovation.

#### **4.4.1.2 Policy text analysis**

This section analyzes linguistic language of the text, a set of selected vocabularies and phrases, examining particular discourses or ideologies on the role of e-learning technologies in universities. Despite the fact that to deduce the ideology for each sentence is impossible, sentences were carefully selected and read to understand the

ideology. Extract 2 (vocabularies, text genres, and discursive types) drawn from Appendix A will be analyzed.

Table 4.7 Policy Text Analysis of University A

NO.	2021-2025 E-learning Plan	Micro	Linkage	Macro
		Delineation (Text Analysis)	Interpretation (Discursive Types)	Explanation (Social Practice)
1	Education Informatization 2.0: Our university is committed to implementing the Education Informatization 2.0 Action Plan to create a technologically advanced, secure, and stable campus network platform that supports its e-learning initiatives.	Education Informatization 2.0 seen as an inevitable trend for university A. The relationship between what university A's plans and readers is portrayed in words like technologically advanced, secure, and stable. The word such as committed is to persuade readers to support the university's initiatives. Confidence (TG1) Persuasion (TG4)	Technocracy (DT1)  Legitimacy (DT2)	University A is trying to obtain support from stakeholders by positioning itself as forward-thinking and aligning with macro-level policy Education Informatization 2.0.
2	Efforts are underway to expand campus network bandwidth, enhance the coverage and density of wireless networks, and build a high-speed, multi-authentication campus network system.	Efforts are underway: This phrase signals a process that is currently in progress, indicating forward movement or development. Confidence (TG1) Factual Information (TG2) high-speed & multi-authentication signals a focus on quality, security and efficiency. Confidence (TG1)	Technocracy (DT1)  Pragmatism(DT6)	The text can be understood as aligning with institutional strategies that prioritize technology as central to growth and student experience.
3	The "Today on Campus" application is being optimized to serve as a one-stop online service platform, streamlining administrative processes and reducing the need for in-person visits, thereby improving convenience for faculty and students.	Streamlining, reducing, and improving serve to persuade stakeholders of the value of these actions. Persuasion (TG4)  Normalization manifested in this context through the use of straightforward vocabulary - convenience.	Pragmatism(DT6)	This integration of technology positions the university as an institution that values innovation and seeks to meet the evolving expectations of a digital-native population.
4	Multimedia teaching resource library is also being established to maximize the audiovisual capabilities of multimedia classrooms and to foster an interconnected and collaborative teaching environment.	'Foster' signals to persuade users' experiences can be enriched. Persuasion (TG4)	Pragmatism(DT6)	It signals a shift towards collaborative learning paradigms.
5	This will enable cross-departmental management and data sharing, improving user experience and administrative efficiency.	"Cross-departmental management and data sharing" emphasize the systematic organization of resources.	Technocracy (DT1) Pragmatism(DT6)	The power dynamics shift, with the institution exercising more oversight over its internal processes and personnel.

Source: Author's own work

#### 4.4.1.3 Discussion on the Test Analysis of Extract 2

The policy text uses a variety of optimistic and forward-thinking terms to depict the university's efforts. The language (See table 4.7) is assertive and formal, reinforcing the idea of planned, purposeful change. Technological determinism is reinforced by a clear technocratic tone, which positions e-learning as the central solution to address complex educational goals. The majority of these benefits are taken for granted without critical questioning.

The policy text underlines a technocratic discourse, emphasizing technological interventions like “high-speed” networks (NO.2) and “big data centres” (NO.5) panaceas for administrative and academic inefficiencies. It establishes legitimacy by aligning the university's initiatives with broader national e-learning policy, framing them as part of a recognized and authoritative effort. The language maintains a dispassionate tone, relying on precise, technical terminology while eschewing emotive appeals, presenting these measures as rational, necessity-driven reforms. Furthermore, it reflects a corporatist orientation, prioritizing operational efficacy and stakeholder satisfaction, while adopting a pragmatic stance that underscores the pursuit of tangible, real-world solutions to systemic challenges.

The policy text prioritizes the enhancement of technological infrastructure and e-learning platforms, yet largely omits discussions on pedagogy and the unique aspects of traditional learning that might inform the development of effective digital

learning environments. This silence is compounded by the normalization of technology, as evidenced by using terms like "convenience"(NO.3), which implicitly suggests that learning can occur anytime and anywhere, facilitated solely by technology. There is an evident assumption that technological solutions, particularly those enhancing efficiency and convenience, are inherently beneficial without critically examining whether online and hybrid teaching can truly match the quality and effectiveness of traditional in-person learning. The policy's focus on efficiency and convenience overlooks the deeper questions of how technology can be used not just for access, but to enhance the educational experience in meaningful, pedagogically sound ways.

#### 4.4.2 CDA of institutional e-learning policies at university B

##### 4.4.2.1 Discursive analysis

The findings revealed that institutional e-learning policies at University B primarily align with Technological Determinism and Instrumentalism. The pinpointed recurring themes and assumptions strongly support the prevalence of deterministic and instrumental discourse. Specifically, the institutional e-learning policies at University B encapsulate five ideological assumptions regarding the role of e-learning technologies:

- *Technology as the key driver of change*
- *Alignment with strategic goals*
- *Equity and Access*

- *Technology as Neutral Tool*
- *Automatic Educational Improvement*

*Technology as the key driver of change*

The policy text asserts that technology is the transformative force at University B, driving changes across educational, operational, and administrative systems. However, while the university's emphasis on "Education Informatization and Innovation" (Extract 1, Appendix B) suggests a forward-looking vision, the term "Education Informatization" remains vague and lacks clear, measurable outcomes. The text offers no specific actions or concrete criteria for defining the concept precisely, leaving room for ambiguous interpretations and raising concerns that it could be used as a rhetorical device rather than a well-defined, actionable strategy.

Further, advanced technologies such as IoT, cloud computing, and AI in the "Smart Digital University" initiative (Extract 2, Appendix B) are presented as the key to creating a data-driven, intelligent educational environment. However, the text fails to provide concrete guidelines on how these technologies will be implemented and how their effectiveness will be measured. This omission weakens the claim that these technologies will directly benefit the university, leaving their specific contributions unclear.

Additionally, the text overgeneralizes the role of technology by implying that its

integration into the university's systems automatically guarantees educational progress. The assumption that technological advancements will address challenges—from operational efficiency to student engagement and academic success—reflects a simplistic view of technology as a one-size-fits-all solution. This perspective overlooks the complexities in technology integration, including the need for proper training, pedagogical considerations, and ongoing support for both faculty and students.

#### *Alignment with strategic goals*

The text lacks sufficient contextualization, leaving key factors under-explored. While it outlines University B's strategic goals, such as excellence, innovation, and sustainability, it does not provide context on the broader educational or technological landscape in which the university is operating. How do these initiatives compare to those of similar institutions, and what external factors, such as outsourcing Learning Management System (LMS) to third-party companies, might influence their success? This absence of context diminishes the understanding of how the university's efforts align with industry trends and external pressures.

Furthermore, the text states that University B's initiatives are inherently aligned with its strategic goals, but it overlooks potential internal contradictions or tensions. For instance, while the "Smart Digital University" initiative (Extract 2, Appendix B) integrates advanced technologies like IoT, cloud computing, and AI to modernize and

innovate, it does not address how these technologies might face challenges in implementation or integration with existing institutional infrastructure.

The text also stipulates that all students and faculty will equally benefit from LMS such as Treenity and Superstar Learn (Extract 4, Appendix B), yet this policy statement disregards potential disparities in access to technology, digital literacy, or varying levels of preparedness across different student demographics. In addition, the text presents the university's goals and initiatives as universally beneficial, neglecting to address the complexities of balancing innovation with inclusivity. For example, the Digital Competence in AI program (Extract 5, Appendix B) is positioned as a key element in preparing students for the modern workforce, but without recognizing that not all students may have equal access to the technological resources or support needed to succeed in such programs. Similarly, operational initiatives like the Smart Campus Platform (Extract 8, Appendix B), while aiming to improve campus services, may not fully address the needs of less tech-savvy or digitally excluded groups within the university community.

### *Equity and Access*

The text outlines University B's "Smart Digital University" initiative to create an inclusive learning environment through enhanced digital infrastructure and equitable access to educational resources. While the projects, such as the "Basic One Platform" and "One Data Repository" (Extract 2, Appendix B), are intended to provide all

students and faculty with access to digital libraries and archives, reducing barriers to information, the text fails to clarify how inclusivity is measured. Terms like "inclusive learning environment" and "critical skills for the digital economy" are used without clear definitions, leaving these concepts open to interpretation. What criteria qualify as inclusivity, and how are these "critical skills" being assessed? Without specifying these details, the text leaves readers with an incomplete understanding of the goals and outcomes of the initiatives.

Furthermore, the text reflects a pro-technology bias, presenting technological initiatives like LMS platforms (Treenity and Superstar), smart classrooms, and IT Help Desks as positive and inclusive means. While these tools are framed as providing equal access and overcoming barriers, discussion of potential limitations or negative consequences is absent. Issues such as whether all students can freely access to these technologies, whether all students' e-readiness are adequate, and whether the number of smart classrooms for all students are sufficient, are not addressed.

The assumption that technology will automatically lead to equity overlooks these complexities and risks oversimplifying the impact of digital tools on diverse student populations. The policy text also overgeneralizes the effects of these initiatives, assuming that technology alone will create equitable access and inclusivity in education. The claim that smart classrooms and IT Help Desks will enhance educational access (Extract 3 & Extract 7, Appendix B) implies that all students will

benefit equally, without considering disparities in students' access to technology or varying levels of digital literacy. Some students may struggle to engage with technology due to personal, socioeconomic, or logistical barriers not addressed in the text.

### *Technology as Neutral Tool*

The policy views technologies, IoT, cloud computing, and AI (Extract 2, Appendix B), as means for elevating teaching and learning by taking advantage of smart classrooms, and LMS (Extract 4, Appendix B). Extract 3 underlines the role of smart classrooms in enriching the learning experiences, but their effectiveness depends on how faculty incorporates them into their teaching. In the policy, e-learning technologies are considered value-neutral means which have determined effects on teaching and learning outcomes. There is a overwhelming trend indicating that e-learning technologies are optimum in any contexts.

### *Automatic Educational Improvement*

The policy text asserts that incorporating technology into educational settings is a straightforward process that primarily requires the right infrastructure and resources. Initiatives like the "Smart Digital University" (Extract 2, Appendix B) and LMS such as Treenity and Superstar (Extract 4, Appendix B) prioritize building digital infrastructure and providing access to online tools, with little emphasis on pedagogical challenges. The Digital Competence in Artificial Intelligence program

(Extract 5, Appendix B) and Smart Campus Platform (Extract 8, Appendix B) reinforce this approach by focusing on technical training and operational efficiency. The overarching belief is that acquiring the right resources and systems will automatically lead to improved educational outcomes (Extract 2, Extract 4, Extract 5, Extract 8, Appendix B). However, these discourses reveal a lack of critical reflection on the sociocultural and organizational factors that impact technology integration, as well as ambiguities in definitions and criteria, highlighting an oversight of the challenges and limitations inherent in these policies.

#### 4.4.2.2 Policy text analysis

This section evaluate the words choices policymakers use upon to convey ideology minds on the role of e-learning technologies in teaching and learning. Extract 2 (vocabularies, text genres, and discursive types) drawn from Appendix B will be analyzed.

Table 4.8 Policy Text Analysis of University B

NO.	2021-2025 E-learning Plan	Micro	Linkage	Macro
		<b>Delineation (Text Analysis)</b>	<b>Interpretation (Discursive Types)</b>	<b>Explanation (Social Practice)</b>
1	Accelerating the Pace of Informatization: The university is committed to intensifying its efforts in Informatization, with the goal of enhancing its digital capabilities.	The text frames "Informatization" as an essential and inevitable solution to institutional challenges, implying that expertise in technology is central to progress.	Technocracy (DT1)	Position University B as actively engaged in modernization, which reflects a broader societal shift toward digitization and technological advancement in education.
2	This includes building secure, stable, sustainable, and advanced technological infrastructure and digital resources for teaching and research.	The words "secure," "stable," and "sustainable" are used to reassure stakeholders that these initiatives are reliable and beneficial.	Legitimacy (DT2)	The language justifies the technological upgrades by emphasizing their safety, stability, and long-term value.
3	By leveraging advanced technologies like the Internet of Things (IoT), cloud	"Leveraging Advanced Technologies like IoT, Cloud Computing, and AI" references	Technology Optimism (DT5)	This reflects technological optimism by emphasizing the potential of new

	computing, and artificial intelligence (AI), the university will implement a "Six-in-One" initiative to develop a scientific, efficient, intelligent, and secure information platform, thereby creating a "Smart Digital University."	advanced technologies suggests that the university is on the cutting edge of innovation Persuasion (TG4) "Building a Smart, Digital University" portrays a future-oriented and inspiring vision of the university's transformation into a "smart" institution. Persuasion (TG4) & Confidence (TG1)	Technocracy (DT1) Corporatism (DT4)	technologies to create a better educational environment. This aligns with the corporatism genre, where the use of "smart" constructs a modern and desirable university identity, resonating with modern business trends and rooted in digital transformation.
4	"Basic One Platform" Construction Project: Strengthening the university's Informatization infrastructure. This involves a comprehensive upgrade of the campus network, improving wireless network coverage, and enhancing service quality.	"Improving wireless network coverage, and enhancing service quality": highlights specific improvements in network service and quality "Comprehensive Upgrade of the Campus Network": signals progress and the idea that technological improvements always lead to better outcomes.	Technocracy (DT1) Neutrality(DT3)  Legitimacy (DT2) Technology Optimism (DT5) Pragmatism(DT6)	The language is devoid of ideological framing and focuses purely on functional improvements.  The optimism is in the assumption that upgrading infrastructure will inherently improve university operations.
5	The construction of a data center as the core infrastructure platform will support the university's informatization needs. Efforts will also be made to strengthen information security to ensure the sustainable development of the university's digital systems.	"Construction of a Data Center as the Core Infrastructure Platform" describes an infrastructure component essential for supporting the university's digital transformation. Factual Information (TG3) "ensure the sustainable development of the university's digital systems" signifies confidence Confidence (TG1) Persuasion (TG4)	Technocracy (DT1)	The discourse is highly infrastructure-centric, focusing on building a technological backbone rather than human-centered educational approaches.  This language eliminates doubt and reassures that sustainability is guaranteed.
6	"One Data Repository" Construction Project: Advancing the development of a campus-wide data platform. This will involve creating a foundational database for the university, standardizing data processes, and improving data management and governance.	"Advancing the Development of a Campus-Wide Data Platform": describes a practical initiative to build a university-wide data platform. Factual Information (TG3) "Creating a Foundational Database for the University": describes the practical step of building a database for standardized data management. Factual Information (TG3) The creation of a "foundational database" is a practical and achievable objective aimed at improving data management. "Standardizing Data Processes and Improving Data Management and Governance": The language is	Technology Optimism (DT5)  Neutrality(DT3)  Pragmatism(DT6)  Pragmatism(DT6) Neutrality(DT3)	This reflects a pragmatic approach to building digital infrastructure for efficient institutional governance.  There is no emotional appeal or ideological language, maintaining a neutral, factual tone.  This reflects a pragmatic approach to building digital infrastructure for efficient institutional governance.  Pragmatism is evident in the practical focus on ensuring efficient and consistent data

		solution-oriented, with an emphasis on standardization and improved management practices.		processes.
7	The project will also promote the development of digital teaching resources, including the digital library and digital archives, expanding learning opportunities for faculty and students and improving the efficiency and quality of archival use.	"Promote the Development of Digital Teaching Resources": Inherently optimistic, suggesting proactive improvement and growth. Persuasion (TG4) Confidence (TG1) "Expanding Learning Opportunities for Faculty and Students": emphasizes expanding access to digital learning resources in a clear, functional way.	Technology Optimism (DT5) Technocracy (DT1)  Pragmatism (DT6) Corporatism (DT4)	This implies that technology will naturally lead to better educational outcomes.  This constructs learning as a product to be scaled and expanded.
8	"One Network ID" Project: Advancing the development of information application and support systems. A unified identity authentication system and a centralized campus information portal will be built to provide a one-stop service for students and faculty.	"One-stop service for students and faculty": emphasizing a unified, simplified digital service for all.  "Centralized Campus Information Portal": implies improved organization and governance "Unified Identity Authentication System": managing identity verification for users Factual Information (TG3)	Technocracy (DT1)  Legitimacy (DT2) Corporatism (DT4)	Technology will automatically improve user experience, without acknowledging potential challenges  Position it as a rational and necessary restructuring effort that will streamline university operations.
9	The integration of information systems will be accelerated, ensuring that key university operations can be carried out online or through mobile devices.	"Integration of information systems": complete digital integration Factual Information (TG3)	Technocracy (DT1)	efficiency-driven discourse
10	"One Form for Services" Project: Advancing the online service system. Based on the university's core database, public information systems, and business information systems, an online form submission system will be developed.	"Advancing the Online Service System": describes a technical improvement without emotional or ideological framing.	Neutrality (DT3) Pragmatism (DT6)	It reinforces a neutral, process-oriented discourse.
11	This system will standardize the collection, review, and updating of faculty and student data. By integrating with other important university business systems, a centralized "one-stop" online service portal will be created, providing a more efficient and user-friendly experience for all stakeholders.	"Providing a More Efficient and User-Friendly Experience for All Stakeholders": constructs digital transformation as universally positive by appealing to efficiency and user experience. Persuasion (TG4)	Legitimacy (DT2) Corporatism (DT4) Technology Optimism (DT5)	The policy reinforces the legitimacy of these initiatives as inclusive and essential.

Source: Author's own work

#### 4.4.2.3 Discussion on the Test Analysis of Extract 2

The strategic alignment within educational institutions is deeply intertwined with their overarching goals of modernization and efficiency. Terms (See Table 4.8) like "Accelerating the Pace of Informatization" (NO.1) and "Building a Smart, Digital University" (NO.3) highlight this alignment, positioning technology adoption not just as a necessity but as a strategic imperative. This is evident in the use of terms that suggest rapid integration and development of technological infrastructures, which are essential to maintain competitive in higher education sector.

Particular phrases, "providing a more efficient and user-friendly experience for all stakeholders" (NO.11), and "expanding learning opportunities for faculty and students"(NO.7), are emergent from Extract 2. They are indicative of Corporatism genre. Corporate language are used to emphasize efficiency, service quality, and innovation. In addition, the focus on "user-friendly experience" (NO.11) and "service quality" (NO.4)mirrors corporate approaches to customer satisfaction. Also, the term "Smart Digital University" (NO.3) reflects a clear branding strategy, positioning the institution as competitive and forward-thinking. However, the discourses in the Accelerating the Pace of Informatization (2015-2021 E-learning plan) remain silent on the challenges stemming from the broader social and cultural implications of Education Informatization.

Absence of critical reflection is indicative of no challenges, risks, or potential negative effects of this Education Informatization in this text, but terms are cautiously selected to unfold policymakers and administrators' intention. The term "Smart Digital University" (NO.3) position University B as a high-level, application-oriented institution towards a prominent role embracing Education Informatization and innovation. University B understands its necessity to serve local economy and align its strategic vision with Education Informatization 2.0 (Extract 1, Appendix B). This vision is critical to building a deterministic and instrumental view on the role of e-learning technologies in teaching and learning.

#### **4.4.3 CDA of institutional e-learning policies at university C**

##### **4.4.3.1 Discursive analysis**

The data interpretation indicated that institutional e-learning policies at University C predominately align with Technological Determinism. The pattern drew from recurring themes indicates a strong inclination of using deterministic discourses. Particularly, institutional e-learning policies at University C convey three ideological assumptions regarding the role of e-learning technologies:

- *Technology as a primary driver of improvement*
- *Focus on Infrastructure and Capability Building*
- *Efficiency and Managerilism*

### *Technology as a primary driver of improvement*

The policy text emphasizes technology as a key driver of educational improvement, with initiatives like the "Smart Campus Initiatives" and "Digital Ecosystem" (Extract 2) integrating advanced technologies into both in-person and online learning environments. However, the policies overgeneralize by assuming that all stakeholders will benefit equally from these technologies, neglecting factors like accessibility and potential resistance among faculty. Similarly, the "Online and Hybrid Course Development" policy (Extract 6) assumes AI tools will universally enhance learning outcomes, overlooking the need for thoughtful planning and faculty adaptation to varied teaching styles.

The "Data-Driven Decision-Making" policy (Extract 4) overemphasizes quantitative data, neglecting qualitative insights from students and faculty that are crucial for a comprehensive understanding of educational success. Additionally, the "Digital Ecosystem" (Extract 2) is presented as a solution for improving education but lacks clarity on how technologies like cloud computing and mobile tools will specifically enhance teaching and learning. This ambiguity makes the concept of a "digital ecosystem" appear overly generalized and risks undermining the policy's practical effectiveness.

### *Focus on Infrastructure and Capability Building*

The policy clearly outlines several specific terms and initiatives that can be classified

under "Focus on Infrastructure and Capability Building", aiming to strengthen its technological infrastructure and stakeholder capabilities. Initiatives like the "Digital Ecosystem" (Extract 2) and the construction of smart classrooms and a smart education platform highlight investments in advanced technologies, such as Wi-Fi 6, IPv6, and SDN, to support a comprehensive e-learning environment. The policy also emphasizes Course Development and Design (Extract 6), ensuring online and hybrid courses integrate AI tools and modern teaching practices. Additionally, the Data-Driven Decision-Making initiative (Extract 4) enhances analytical capabilities for evaluating learning outcomes and program effectiveness.

However, the policy's underlying assumption that 'technology equals progress' exemplifies technological determinism, which overlooks the varying responses from stakeholders. The reliance on data-driven approaches also risks oversimplifying complex educational outcomes, reducing them to numerical metrics and ignoring the limitations and ethical concerns of data collection, including potential privacy issues. Moreover, the concept of smart classrooms is presented ambiguously, lacking clarity on their true innovation compared to traditional classrooms, raising questions about whether they genuinely improve education or merely repurpose existing methods with new technology. Finally, over-reliance on technological infrastructure risks excluding alternative, non-tech-oriented approaches to teaching and learning, reflects a bias that could marginalize diverse perspectives on teaching and learning.

### *Efficiency and Managerilism*

The policy signifies a trend centred on streamlining operations and improving educational delivery. The "Data-Driven Decision-Making" initiative (Extract 4) exemplifies this by prioritizing data to inform learning outcomes and program effectiveness, enhancing efficiency and outcomes. The "Digital Ecosystem" (Extract 2) further supports this approach, upgrading infrastructure to improve user experiences and centralize data management, while the "Software Services Outsourcing" policy (Extract 7) structures vendor selection to optimize service delivery. Additionally, the "Information Technology Campus Development Policy" (Extract 8) and the "E-Learning Budget Procurement Policy" (Extract 9) highlight the university's efforts to manage resources through strategic financial and project management practices.

Yet, critics of the outsourcing strategy point out that it assumes third-party LMS vendors will always deliver more efficient services. However, this could lead to a loss of control, and accountability problems. The policy also seems to prioritize cost-cutting and efficiency over fostering innovation within the institution, overlooking the value of in-house expertise and tailored solutions. Additionally, the belief that efficiency alone can improve educational outcomes overlooks the more personal aspects of education, like faculty autonomy, student involvement, and critical thinking, reducing education to just a process rather than a collaborative, human-centred experience.

#### 4.4.3.2 Policy text analysis

An in-depth analysis of words and phrases that contained in the policy text of Extract 2 from Appendix C will be demonstrated in this section, which renders ideology on the particular role of e-learning technologies in teaching and learning.

Table 4.9 Policy Text Analysis of University C

NO.	2021-2025 E-learning Plan	Micro	Linkage	Macro
		Delineation (Text Analysis)	Interpretation (Discursive Types)	Explanation (Social Practice)
1	Advancing E-Learning Through Smart Campus Initiatives: The university C is actively integrating cutting-edge technology into its educational framework to enhance e-learning. Through its partnership with Huawei, the university is building a smart campus that emphasizes the construction of smart classrooms, digital teaching platforms, and data-sharing systems.	The text frames "Smart Campus Initiatives" as the backbone of educational reform. Confidence (TG1) "Smart Classrooms" signifies the deployment of advanced infrastructure, linking technological tools with improved pedagogy Persuasion (TG4)	Technocracy (DT1) Corporatism (DT4) Technology Optimism (DT5)	This phrase represents a technocratic solution, signaling that modernization and digital integration are prerequisites for success.
		The phrase "cutting-edge" carries an objective, technical tone. Persuasion (TG4)	Technocracy (DT1)	Physical and digital spaces must be upgraded to foster innovation.
		"Partnership with Huawei" signaling that the university collaborates with private companies for technological development.	Neutrality(DT3)	Positioning the integration of technology as a matter of practical necessity without engaging in emotional or persuasive language
2	The development of a university-wide smart education platform will enable seamless integration between in-person and online learning, creating a versatile environment for innovative teaching practices.	"Development of a University-Wide Smart Education Platform" indicates a factual initiative to create a specific platform Confidence (TG1) Factual Information (TG3) "seamless integration" is framed as an unquestionable good.	Technocracy (DT1)	Leaving no ambiguity or doubt about the effectiveness of the initiative. Suggesting that blending traditional and digital education is not only beneficial but inevitable in the pursuit of modern education.
		The word "innovative" carries strong legitimizing power The confident tone in "will enable" suggests that success is guaranteed. Confidence (TG1)	Legitimacy (DT2)	Portraying any associated technological initiatives as forward-thinking and aligned with the future of education.
			Legitimacy (DT2)	
3	By leveraging resources such as smart classrooms and content creation facilities, the platform will support modern teaching methods and promote reforms in instructional approaches.	The term "reforms" connotes progress and improvement.	Legitimacy (DT2)	Portraying technological initiatives as forward-thinking
		The emphasis on "innovation" and "reform" aligns with the corporate focus on continuous improvement.	Corporatism (DT4)	Portraying the university as a leader in adopting new practices.

4	Building a Digital Ecosystem to Support E-Learning: Aims to upgrade its technological infrastructure, such as full Wi-Fi 6 coverage and increased network bandwidth.	<p>“Building a Digital Ecosystem to Support E-Learning”:remains descriptive and factual &amp; legitimizes the shift toward a comprehensive digital approach by presenting it as a necessary infrastructure to support educational goals</p> <p>Factual Information (TG3)</p> <p>“Full Wi-Fi 6 Coverage and Increased Network Bandwidth”employs highly technical terminology to describe infrastructure upgrades.</p> <p>The term “upgrade” is used with an air of certainty.</p> <p>Confidence (TG1)</p>	<p>Legitimacy (DT2)</p> <p>Neutrality(DT3)</p>	<p>Implying that without it, educational progress would be hindered.</p> <p>Conveying neutrality through a focus on facts and specifications rather than subjective or ideological framing</p> <p>Implying that this enhancement is not just a possibility but an inevitable step in the university’s growth</p>
5	Advanced network solutions, including IPv6 and SDN technologies, will establish a robust, ubiquitous campus network. Guided by a focus on mobility and integration. Developing a comprehensive digital ecosystem powered by big data, cloud computing, and mobile technologies.	<p>The use of specific technological terms such as “IPv6” and “SDN technologies” reflects a Factual Information (TG3)</p> <p>“Guided” gives the impression of deliberate, well-thought-out planning.</p> <p>Confidence (TG1)</p> <p>“Powered by Big Data, Cloud Computing, and Mobile Technologies” offers an objective depiction of the technology involved in the digital ecosystem.</p> <p>Factual Information (TG3)</p>	<p>Technocracy (DT1)</p> <p>Legitimacy (DT2)</p> <p>Neutrality(DT3)</p>	<p>Reflects the highly specialized nature of the discourse, signaling reliance on technological expertise to meet educational goals.</p> <p>Legitimizes the technological initiatives as carefully designed and aligned with broader institutional strategies.</p> <p>Portraying technology as a neutral and necessary enabler of progress</p>
6	This ecosystem aims to support centralized data management and streamlined “One-Stop Services”, and to optimize processes and improve user experiences. By aligning these initiatives with its e-learning goals, the university aims to empower classroom teaching and learning.	<p>“One-Stop Services” represents a push for streamlined, technology-mediated solutions.</p> <p>The focus on “optimization” and “improvement” reflects a confident belief that technological solutions can enhance efficiency.</p> <p>The term “empower” reflects a positive and ambitious view of technology. Confidence (TG1)</p>	<p>Technocracy (DT1)</p> <p>Neutrality(DT3)</p> <p>Corporatism (DT4)</p> <p>Technology Optimism (DT5)</p> <p>Legitimacy (DT2)</p> <p>Technology Optimism (DT5)</p>	<p>Reinforcing the discourse of efficiency and user-centered technology design.</p> <p>Do not acknowledge potential challenges</p> <p>As an enabler of better teaching outcomes and greater student engagement</p>

Source: Author’s own work

#### 4.4.3.3 Discussion on the Test Analysis of Extract 2

The Extract 2 applies a range of optimistic and forward-looking discourses to unravel the university's e-learning plan between 2021 and 2025 (See table 4.9). Discourses in this policy text serve to reinforce University C’s identity, the idea of future-oriented,

efficient, and student-centered image. It indicates a strong focus on Technological Determinism, with few focuses on human agency or potential challenges.

The language emphasizes the need for cutting-edge technology and constructing a "digital ecosystem" (NO.4 & 6) to support learning and administrative processes. The recurrent use of terms such as "smart campus," "smart classrooms," (NO.1) and "advanced network solutions" (NO.5) signals the centrality of technology as a driving force in improving educational outcomes. However, the policy conveyed that all stakeholders will benefit equally from these advancements, overlooking factors such as accessibility disparities among students and potential resistance from faculty members who may be less familiar with or open to new technologies. This tension between the policy's goal of universal technological integration and the reality of diverse needs creates a gap that risks excluding marginalized groups or individuals who may not be adequately supported in the transition to a technology-driven educational model.

While the term "smart campus" (NO.1) implies innovation, the policy lacks clarity about what change these technologies will bring to "in-person and online learning environments"(NO.2). For instance, the concept of "smart classrooms" (NO.1) is presented ambiguously, with little explanation of how they differ from or improve upon traditional multimedia classrooms beyond embracing new technologies. This ambiguity undermines the policy's credibility and invites skepticism about whether

the investments in infrastructure could yield substantive improvements in pedagogy or merely offering superficial enhancements that do not challenge traditional teaching practices.

The emphasis on constructing a "Digital Ecosystem" (NO.4) to support e-learning further exacerbates these concerns, as it is presented as a broad solution without clear details on how specific technologies like cloud computing and mobile tools will enhance teaching and learning. This vagueness creates tension between University C's promise of efficiency and improvement and its inability to demonstrate clear, actionable plans for how these technologies will lead to tangible educational outcomes.



#### **4.4.4 CDA of institutional e-learning policies at university D**

##### **4.4.4.1 Discursive analysis**

The findings indicated that institutional e-learning policies at University D are heavily shaped by Technological Determinism. A closer look at the recurring themes and embedded assumptions points to a strong focus on deterministic discourses. While there are some discourses of instrumentalism, the policy text's overarching emphasis on e-learning as catalyst for reform suggests a overwhelming inclination towards Technological Determinism. University D' e-learning policies rests on four ideological assumptions about the role of e-learning technologies in education.

- *Technology as a Solution*

- *Enhancement of Educational Practices*
- *Progress and Modernization*
- *Universal Benefits*

### *Technology as a Solution*

University D's E-learning Plan 2021-2025 (Text 1, Appendix D) positions technology as the cornerstone of its educational strategy, emphasizing the construction of a "smart campus" to modernize campus operations and education programs, thereby making the learning environment more responsive to student needs. The policy outlines a "data-driven approach," leveraging analytics to inform teaching and learning, and integrates "cloud-based infrastructure" alongside "AI and big data" to personalize learning and improve outcomes.



Furthermore, "cybersecurity measures" (Extract 4, Appendix D) underscore the university's commitment to safeguarding e-learning platforms. However, this approach presents a simplified view of the role of technology in education, overlooking the complex challenges inherent in implementing such systems. The policy fails to account for faculty readiness, disparities in student access, and the infrastructure gap across different departments. By assuming that technological advancements alone can address educational shortcomings, the plan neglects that technology, when poorly implemented or over-relied upon, can exacerbate inequities and disrupt the learning process. The policy's uncritical reliance on technology as the

primary driver of educational reform may limit its practical efforts and risk marginalizing the needs of diverse stakeholders.

### *Enhancement of Educational Practices*

The policy text from University D contains numerous terms and initiatives that can be classified under "Enhancement of Educational Practices." These include the creation of a "modern educational ecosystem," the integration of "information technology into educational practices," and the establishment of a "learner-centred ecosystem." These initiatives are designed to transform and enhance teaching and learning for students and faculty. The objective of policy is to stress the role of e-learning technologies on improving teaching and learning practices, yet learning objectives are absent in the policy text, neither is feasible e-learning strategies to meet learning objectives. The policy text muddles the concept of e-learning by using broad terms, creating ambiguity about how e-learning technologies can be effectively used to enhance educational practices.

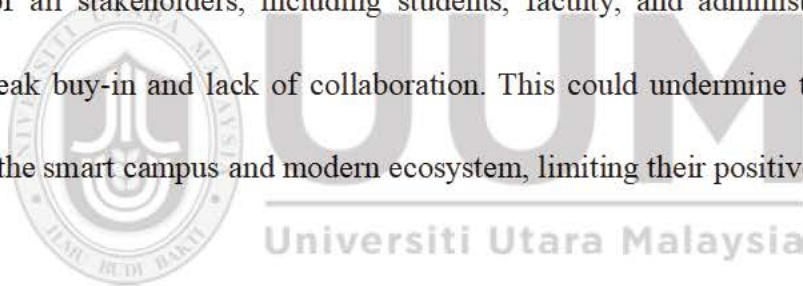
In addition, discourses related to the possible resistance to change in teaching and learning, however, are silent. The policy's focus on a "learner-centered ecosystem" and the shift towards AI-driven, personalized assessments may face resistance from faculty members who are either unprepared for or skeptical of these technologies. Faculty's concerns over the impact of these changes on their teaching autonomy and workload are silent in the policy text.

### *Progress and Modernization*

Various discourses in the policy text anchored "Progress and Modernization," positioning technological integration as the key driver for the university's evolution in an evolving educational landscape. Central to this approach are terms such as "Education Informatization," "modern education ecosystem," "smart campus," and "high-speed networks and intelligent services," all of which underscore the university's aim to enhance its educational and administrative frameworks. The "Education Informatization," articulated in the E-learning Plan (2021-2025), encapsulates the university's overarching strategy to embed e-learning technologies across its operations, thereby improving the well-being of faculty and students while upgrading educational delivery to meet contemporary standards. The "modern education ecosystem" envisions a digitally infused environment that promotes growth, in teaching and administration services, ensuring the institution's adaptability to the digital age. The "smart campus" initiative further amplifies this vision, aiming to create a fully integrated digital infrastructure that merges physical and virtual learning spaces, thus facilitating a seamless and efficient educational experience. The high-speed networks and intelligent services enable real-time data sharing and the application of advanced educational tools, reinforcing a sophisticated, data-driven learning environment. By weaving together these terms and initiatives, University D demonstrates a clear commitment to modernization, positioning itself as a leader in educational innovation.

However, the policy text states that these efforts will place the university "at the forefront of educational innovation" oversimplifies the concept of innovation by assuming that sophisticated infrastructure alone equals educational success. It fails to consider how these technologies will be applied or whether the institution's culture and resources are prepared to support such a shift.

Discourses related to stakeholder involvement are silent. In policy text, a top-down approach to implementing technological change without considering the views and readiness of all stakeholders, including students, faculty, and administrators, may result in weak buy-in and lack of collaboration. This could undermine the intended benefits of the smart campus and modern ecosystem, limiting their positive impact.



### *Universal Benefits*

University D's initiatives focus on "Universal Benefits," aiming to impact all stakeholders through terms like "holistic student development," "learner-centred ecosystem," "anytime-anywhere access," and "increasing digital literacy." The E-learning Plan (2021-2025) highlights the university's commitment to fostering academic and personal growth, ensuring a comprehensive educational experience. Prioritizing personalized learning and flexibility, the shift to a learner-centred ecosystem addresses diverse needs. "Anytime-anywhere access" enhances learning for all, regardless of time or location, while increasing digital literacy ensures

everyone is equipped for online and hybrid learning. These efforts aim to provide equitable opportunities, strengthening individual outcomes and the educational community in a fast-paced evolving e-learning landscape.

However, the policy text implies that these initiatives will universally improve outcomes without considering the nuanced needs of different disciplines or teaching methods, which may require more tailored approaches. While the concept of "holistic student development" sounds promising, it remains vague, lacking clear details about how it will be implemented or measured—whether it encompasses emotional, psychological, and academic support, or professional skills development. Additionally, the discourse presents a false cause fallacy by suggesting that the creation of a learner-centered ecosystem and universal access to resources will directly lead to improved educational outcomes, without accounting for other factors such as student motivation, learning styles, or institutional support systems. This overlooks the possibility that the focus on personalized learning and digital literacy might obscure the necessity of deeper, human-centered support, including emotional or mental health resources, which are often critical for student well-being but seldom discussed in the context of technological advancement.

#### **4.4.4.2 Policy text analysis**

This section provides an interpretation of the language choices employed by policymakers to articulate their ideological stance on the role of e-learning

technologies in teaching and learning. An analysis will be conducted on Text 1 (vocabularies, text genres, and discursive types) as outlined in Appendix D.

Table 4.10 Policy Text Analysis of University D

NO.	2021-2025 E-learning Plan	Micro	Linkage	Macro
		<b>Delineation (Text Analysis)</b>	<b>Interpretation (Discursive Types)</b>	<b>Explanation (Social Practice)</b>
1	Campus information infrastructure will prioritize enhancing the well-being of both faculty and students, alongside fostering holistic student development, as core goals of Education Informatization 2.0.	"Education Informatization 2.0" symbolizes the belief in technology as the primary driver of educational reform. "Holistic Student Development" legitimizes the policy by framing it as student-centered and socially responsible. "Campus Information Infrastructure" a specific aspect of the university's Education Informatization 2.0 initiative. Factual Information (TG3)	Technocracy (DT1) Technology Optimism (DT5)  Legitimacy (DT2)	It implies that educational progress depends on adapting to digital systems.  The Education Informatization 2.0 is necessary for comprehensive student development
2	The plan will rely on a data-driven approach to implement deep educational reforms, ultimately seeking to establish a modern educational ecosystem that nurtures meaningful growth in schools..	"Data-Driven Approach" signifies reliance on practical, evidence-based decision-making.	Pragmatism(DT6)	It suggests that policies will be shaped by measurable outcomes.
3	The guiding principles for this Informatization will be underpinned by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and the spirit of the National Education Conference.	The principle establishes political legitimacy by aligning the policy with the broader national ideology.	Legitimacy (DT2)	It positions the digital transformation not just as a technical reform but as a political and moral imperative, reinforcing its importance and credibility.
4	Innovation and integration will be key, as the merging of the internet and education drives changes in educational philosophy, teaching methods, and evaluation.	"Innovation and Integration" used in corporate discourse to promote continuous improvement and competitive advantage. Confidence (TG1)	Corporatism (DT4)	It reinforces the policy's focus on technological upgrades and modernization
5	A collaborative ecosystem will be fostered, promoting data sharing and a user-centered approach that breaks down data silos and supports collective development.	"Collaborative Ecosystem" This term borrows from corporate ecosystems, where partnerships, data sharing, and co-creation are emphasized for organizational success.	Corporatism (DT4)	It suggests a business-like approach to governance within education.
6	The development goals of this initiative aim to build a fully integrated "smart campus" that combines physical and virtual learning environments	"Smart Campus"-A highly optimistic phrase.  The word "fully" reflects completeness and certainty in	Technology Optimism (DT5)	Technology seamlessly integrates into learning and administration.  It conveys assurance in the

	into a cohesive, data-driven space.	achieving a cohesive integration of physical and virtual learning environments. Confidence (TG1)		success of this transformation.
7	A learner-centered ecosystem will be developed to provide more personalized, accessible, and flexible learning experiences for students. This shift in focus will support a broader vision of transforming education into a more modern and adaptive system, with the power to meet the needs of both teachers and learners in the digital age.	"Learner-Centered Ecosystem" enabled by technology reflects optimism about how digital tools can create more personalized. Persuasion (TG4)  "Personalized, Accessible, and Flexible Learning Experiences" Emphasizes customization and adaptability in education, driven by digital tools and data.	Technology Optimism (DT5)  Technocracy (DT1)	Empowering educational experiences for students.  It positions technology as a solution for meeting diverse student needs.
8	Priority initiatives outlined in the plan will include establishing a cloud-based smart campus infrastructure that enables cross-departmental data sharing through high-speed networks and intelligent services.	"Smart Campus Infrastructure" mirrors corporate language associated with smart business models and infrastructure modernization.  "Cross-Departmental Data Sharing" presents data sharing as a neutral, technical necessity for improving efficiency and decision-making.	Corporatism (DT4)  Neutrality(DT3)	It reflects a focus on technology as an asset for streamlining operations and improving service delivery.  It avoids any overt reference to power dynamics or potential privacy concerns.
9	Additionally, the creation of a smart learning environment will modernize classrooms and offer flexible, anytime-anywhere access to educational resources. A data-driven evaluation system will also be implemented to provide personalized assessments for students and teachers, powered by AI and big data.	"Flexible, Anytime-Anywhere Access" reflects the belief that technology breaks down barriers to education  "Data-Driven Evaluation System" provides factual information about the specific tools and methods being used in the policy. Factual Information (TG3)	Technology Optimism (DT5)	Providing unlimited learning opportunities and making education more equitable and accessible
10	Governance will be enhanced through a one-stop e-learning platform to streamline administrative support and improve efficiency. Efforts will also focus on increasing digital literacy for faculty and students, combining technical skills with problem-solving capabilities to ensure that all members of the academic community are equipped for the digital transformation.	"Efficiency and Streamlined Administrative Support" mirrors corporate discourse on operational efficiency and optimizing administrative processes to reduce overhead and improve outcomes.  "Technical Skills Combined with Problem-Solving Capabilities" reflects a practical approach to digital literacy by combining technical know-how with real-world problem-solving	Corporatism (DT4)  Pragmatism(DT6)	It positions governance as service delivery rather than traditional administration.  Ensuring that students and faculty are prepared to tackle challenges.
11	Finally, a smart security system will be put in place to ensure cybersecurity, with proactive monitoring and	"Smart Security System Will Be Put in Place to Ensure Cybersecurity" implies certainty and control, assuring		

	emergency response protocols to safeguard data and information.	stakeholders that security will be thoroughly addressed and maintained. Confidence (TG1)		
12	Increased funding from various sources will be essential to sustain digital projects, particularly those focused on teaching technology and smart learning environments.	"Increased Funding from Various Sources Will Be Essential" This phrase makes a financial argument to persuade stakeholders of the importance of investment and resource allocation. Persuasion (TG4)		Positioning funding as critical for success.

Source: Author's own work

#### 4.4.4.3 Discussion on the Test Analysis of Text 1

The policy text (See Table 4.10) contains a repetitive use of positive and idealistic language indicating the promising e-learning technologies in teaching and learning. Vocabularies, such as "enhancing well-being" (NO.1), "holistic development" (NO.1), "meaningful growth" (NO.2), "innovation" (NO.4), "integration"(NO.4), "transformation"(NO.7) create an overwhelmingly optimistic language. These are buzzwords that carry positive connotations such as progress, improvement, and desirable outcomes but remain vague and open-ended. There is no detailed actions or measurable outcomes.

The predominated text genres are TG1 (demonstrating confidence) and TG4 (persuasion), which are consistently with technocracy and technological optimism. However, words like "modern educational ecosystem", "intelligent campus environment", and "fully integrated smart campus" are vague and lack operational definitions. These terms can be broadly interpreted in various ways, making these difficult to assess what actual e-learning initiatives embarked.

The discourse centered on efficiency, education informatization, and goal-setting

reflects a distinctly neoliberal approach, emphasizing performance metrics, surveillance, and corporate-style governance in education. The notion of a "learner-centered ecosystem" further reinforces this ideology by shifting responsibility for learning onto individuals, implicitly downplaying the role of institutional and social support systems in shaping educational outcomes.

The Text 1 implicitly positions physical classroom teaching as outdated and ethnology-oriented teaching as superior. However, either discussion on hybrid models or negatives of over-reliance on technology is absent. Critical discourses do exist but are largely hidden under layers of techno-optimism and ideological reinforcement. The policy avoids discussing risks, ethical dilemmas, or alternative viewpoints, creating an unquestioned narrative that assumes e-learning technologies are inherently beneficial.

#### **4.5 The Alignment between Education Informatization 2.0 and Institutional e-learning policy**

The interaction between Education Informatization 2.0 and institutional e-learning policy is a complex sway between macro-level directives and institutional autonomy. Education Informatization 2.0, advocating for the deep integration of e-learning technologies into teaching, learning, and administration, provides a broad framework that universities must interpret and apply within their specific contexts.

In this section, a structured comparative CDA approach combined with systematic

scoring method will analyze whether e-learning policies at four universities align with the tenets of Education Informatization 2.0. Analyzing the policy text, e-learning strategies, and discursive framing, this section identifies key areas whether there is convergence or divergence. To ensure the reliability and validity of this analysis, the researcher applies a systematic scoring method to assess the alignment. Providing a objective way to assess to what extent institutional e-learning policies align with Education Informatization 2.0, systematic scoring used in this context can minimize bias and identify gaps (Brown, et al, 2007; Lim & Wang, 2016). A structured scoring system can be used to examine various factors, such as objectives, partnerships, research and evaluation, and learning support, related to e-learning policy (Gao, et al, 2021). The scoring method not only allows institutions to refine strategies to keep in line with national directives but also adds value to strategic planning through data-driven insights, optimizing resource allocation and policy impact (Lim & Wang, 2016).

To be more specific, this systematic scoring method can index how institutional e-learning policies align with macro-level policy, and it also can captures the discursive strategies used in the policy text-whether they reinforce authority, emphasize technocracy, or introduce institutional discretion. Fusing data and discourse-level insights, this method introduces an in-depth understanding of how universities steer state-level e-learning directives. Examining institutional e-learning policies at each university, a structured scoring system, five steps, in this context will

be applied. They are listed as following:

- *Allocating a scoring system for each standard*
- *Implementing the scoring system for each individual standard*
- *Computing the overall score and assessing the level of alignment*
- *Analyzing the extent of alignment*
- *Analyzing the data from each university in the sample*

*Allocating a scoring system for each standard*

Each criterion of systemic scoring method is rated on a scale of full alignment, partial alignment, or misalignment, which are classified in the following table 4.11:

Table 4.11 Scale for the level of Policy Alignment

Rank	Score	Description
Full Alignment	2	The criterion fully conforms to the principles outlined in Education Informatization 2.0, demonstrating strong adherence to national guidelines. The policy explicitly integrates the expected approach, consistently applying relevant strategies, language, or structural elements in a manner that reinforces alignment.
Partial Alignment	1	The criterion aligns with Education Informatization 2.0 in some aspects but allows for institutional flexibility, selective adaptation, or variation in implementation. While key elements are present, they may not be consistently applied or may diverge in certain areas, leading to a mixed or moderate level of alignment.
Misalignment	0	The criterion largely deviates from Education Informatization 2.0, either by prioritizing institutional autonomy, disregarding national guidelines, or employing approaches that contradict expected standards. There is little to no evidence of integration, resulting in a lack of alignment with the intended policy framework.

Source: Adapted from Gao, et al. (2021)

As CDA of Education Informatization 2.0 displayed, nine emerging themes are Government Role, Institutional Responsibilities, Institutional Leadership, Public-Private Partnership, International Collaboration, Technology Adoption,

Pedagogical Innovation, Funding and Resource Allocation, and Digital Literacy of Faculty and Students. Also there are direct language that contain compliance-focused discourses. Four Discursive Types (Technocracy, Legitimacy, Neutrality, and Corporatism) and one Text Genre (Persuasion-convincing tone) of CDA show the outlay of discursive framing.

*Implementing the scoring system for each individual standard*

As the table 4.12 shows the particular details of criterion determine whether key aspects of institutional e-learning policies at universities align with the tenets of Education Informatization 2.0.

Table 4.12 Criteria for Policy Alignment

Criteria	Education Informatization 2.0 (Benchmark)
Government Role-Strong central leadership, and national policy directives	Whether the university acknowledge government control or emphasize institutional autonomy?
Institutional Responsibility-Universities must implement e-learning policies as per national strategy.	Whether e-learning framed as an institutional responsibility or a government mandate?
Institutional Leadership-Institutional leaders (e.g., CIOs) are responsible for driving e-learning strategies, ensuring compliance, and balancing innovation with national standards.	Whether the university mandate leadership roles in e-learning, or does it offer flexibility?
Public-private Partnership-Encourages industry collaboration for investment in digital education.	Whether the university mention partnerships with tech firms or private investors?
International Collaboration-Promotes engagement with global organizations like UNESCO, UNICEF.	Whether the university emphasize global engagement or remain locally focused?
Technology Adoption-Smart Campus Infrastructure, Smart Classrooms, Data-driven decision-making, LMS, e-learning tools.	Whether specific technologies/digital infrastructure mandated, or the university have flexibility?
Funding & Resource allocation-Government-directed funding, diversified investment strategies.	Whether the policy depend on government funding, internal or external investments?
Pedagogical Innovation-Encourages adaptive learning, blended learning models, and student-centered teaching.	Whether the university promote innovative pedagogical approaches, or does it rely on traditional methods?
Digital Literacy for Faculty & Students-Promotes digital literacy training programs, equipping students and Faculty with necessary technological skills.	Whether the policy mandates digital literacy programs, or is it an optional initiative? Whether the policy promotes regular assessment of students' e-readiness ?

Directive Language-Reinforces government authority.	Whether the university policy use authoritative terms like "must," "require," or "mandate"?
Technocracy-Emphasizes technology as the key solution.	Whether the policy suggest e-learning is the only way forward, ignoring challenges?
Legitimacy-Reinforces the policy's authority	Whether the university positions education informatization/digital transformation as unquestionable, or does it challenge certain aspects of Education informatization 2.0?
Neutrality-Presents policies as unbiased and universally beneficial.	Whether the university present e-learning as neutral, or it acknowledges potential biases or challenges?
Corporatism-Highlights collaboration between institutions and external partners.	Whether the policy emphasize shared responsibility or focus more on institutional independence?
Persuasion-Uses rhetorical strategies to influence stakeholders.	Whether the policy use aspirational language like "transformative impact" or "revolutionary change" to convince stakeholders?
Degree of Alignment	Full / Partial / Misalignment

Source: Adapted from MOE (2018)

The criteria will be used to assign a score (0, 1, or 2) based on how well each university's e-learning policies aligns with each benchmark in Education Informatization 2.0 (See table 4.13).

Table 4.13 Total Score for Each of Four Universities

Criteria	University A	University B	University C	University D
Government Role	2	1	1	1
Institutional Responsibility	1	1	1	1
Institutional Leadership	1	1	1	2
Public-Private Partnership	1	1	1	2
International Collaboration	0	0	0	0
Technology Adoption	1	1	1	1
Funding & Resource Allocation	1	1	1	1
Pedagogical Innovation	1	1	1	2
Digital Literacy of Faculty & Students	1	1	1	1
Directive Language	1	0	1	1
Technocracy	2	2	2	2
Legitimacy	2	2	2	2
Neutrality	2	2	2	2
Corporatism	1	0	1	1
Persuasion	2	2	2	2
<b>Total Score</b>	<b>19</b>	<b>17</b>	<b>18</b>	<b>21</b>

Source: Author's own work

*Computing the overall score and assessing the level of alignment*

This step helps the researcher establish the overall alignment percentage-cumulative

scores, segmenting universities into three categories-Full, Partial, or Misalignment.

The formula for degree of alignment is listed as following:

$$\text{Alignment Percentage} = \frac{\text{Total Score of the University}}{\text{Maximum Possible Scores (14 criteria X 2=28)}} \times 100$$

Table 4.14 Degree of Alignment among Four Universities

University Code	Total Score	Alignment Percentage	Degree of Alignment
University A	19	67.9%	Partial Alignment
University B	17	60.7%	Partial Alignment
University C	18	64.3%	Partial Alignment
University D	21	75%	Full Alignment

Source: Author's own work

#### *Analyzing the extent of alignment*

As the figure 4.6 shows that a sophisticate framework rates how universities position their e-learning policies in relation to objectives of Education Informatization 2.0. The framework contains three categories: Full Alignment, Partial Alignment, and Misalignment.

Alignment Level	Interpretation
<b>Full Alignment (70-100%)</b>	The university largely integrates Education Informatization 2.0 principles in its policy. It generally follows national mandates and uses discourse that reinforces government authority, technocracy, and corporatism
<b>Partial Alignment (40-69%)</b>	The university aligns with some aspects of Education Informatization 2.0 but allows institutional discretion. There may be differences in policy framing, flexibility in implementation, or gaps in compliance.
<b>Misalignment (0-39%)</b>	The university's e-learning policy diverges significantly from national standards. It may prioritize institutional autonomy, lack national compliance, or use a different discursive framing that challenges technocratic perspectives.

Figure 4.6 Interpretation for the level of Policy Alignment

Source: Author's own work

*Analyzing the data from each university in the sample*

A detailed data interpretation of how e-learning policies of each university align with Education Informatization 2.0 will be outlined in sections 4.5.1-4.5.4.

#### **4.5.1 University A (Partial Alignment)**

With a structured yet malleable approach, University A shapes its e-learning policies following the guidelines of Education Informatization 2.0. The institution consistently follows national directives yet allows for adaptations in its specific educational context. E-learning policies at University A exhibits a notion that tenets of Education Informatization 2.0 are prioritized, but autonomy is preserved in the field of institutional leadership, public-private partnerships, technology adoption, pedagogical innovation, and digital literacy initiatives. However, this level of autonomy does not conflict with objectives of Education Informatization 2.0. The university partially aligns its institutional leadership with principles of Education Informatization 2.0. This partial alignment indicates that although there is no CIO running e-learning initiatives at University A, but CIO's role and responsibilities are distributed to multiple departments. Also, the university outsources its LMS to third-party vendors such as Treenity, Rain Classroom, Superstar, and U-campus, yet the institution does not co-invest in developing LMS or other e-learning tools with other parties. In contrast, a significant misalignment occurs in international collaboration, as University A does not participate in global initiatives or engage with international organizations, corroborating University A's mission and vision-focused on serving

local economy.

In addition, to integrate smart campus and classroom infrastructure, and data-driven decision-making, University A mirrors partial alignment with national directives. In this case, the university retains autonomy in its selection of e-learning tools and LMS. Its funding strategies, however, though over-relied on government funding, lack the diversified investment strategy specified by the macro-level e-learning policy. As the university has adopted blended learning and student-centered approaches yet has not fully embraced adaptive learning tools and approaches, pedagogical innovation reflect partial alignment. In a similar vein, digital literacy initiatives for faculty and students are versatile but remain optional and restricted to a narrow set of groups. Besides this, there is no assessment of students' e-readiness, which is required in the section of Students' digital literacy in Education Informatization 2.0. This trend underlines University A's intention to complying with national directives while leaving room for autonomy.

In summary, University A's e-learning policies indeed largely align with strategic goals of Education Informatization 2.0. but expose a gap. The optional nature of digital literacy training programs, remained restricted access to all students and faculty. A lack of structured approach to assessing students' e-readiness further exacerbates disparities among their technological preparedness. Education Informatization 2.0 outlines the necessity of mandatory training to ensure universal

digital competency. Without compulsory participation and systematic implementation, digital literacy initiatives risk inconsistent adoption across departments and faculty, creating disparities in technological preparedness that undermine the broader goals of Education Informatization 2.0.

Directive language falls under partial alignment, as University A's e-learning policies employs authoritative and directive terms in a moderate level. Discursive strategies of University A's e-learning policies indicate that with exception of one criterion-directive language, the policies fully align with three Discursive Types (technocracy, legitimacy, neutrality), and one Text Genre (persuasion) of Education Informatization 2.0. This trend indicates that e-learning policies at University A steadfastly employ e-learning technologies as the central solution, augment the authority of national directives without critiques, place Education Informatization 2.0 in an overwhelmingly positive position, and use persuasive tone to highlight the transformative drive of e-learning technologies. The engagement with industry partners, however, mirrors merely partial alignment with the corporatism, owing to the fact that the voice to collaborate with tech companies co-developing e-learning tools, LMS, and e-learning platforms is silent in University A's strategic planning and educational development.

#### **4.5.2 University B (Partial Alignment)**

University B's e-learning policies fairly adopt strategic objectives of Education

Informatization 2.0 but show a strong inclination to guaranteeing University B's autonomy custom-made to its e-learning landscape. Although the institution grasps the essentials of frontier e-learning technologies, its scheme is more self-directed, with a certain level of autonomy. This leads to partial alignment, as its institutional e-learning policies are guided more by institutional priorities than by national mandates. Institutional autonomy is preserved in the field of institutional leadership, public-private partnerships, technology adoption, pedagogical innovation, and digital literacy initiatives. Institutional leadership falls under partial alignment, as the role of the Division of Network and Educational Informatization, is appointed to fulfil CIO responsibilities, but is not actively involved in driving key e-learning initiatives such as digital literacy, pedagogical innovation, and partnerships with private tech companies. As institutional leadership is silent, the university struggles to fully integrate e-learning strategies, leading to a scattered approach rather than a sophisticated e-learning ecosystem. Also, it is worth noticing that University B does not strategically align with private tech companies co-developing LMS to meet institution-tailored needs but instead partners with third-party LMS vendors. Even though University B has adopted emerging e-learning technologies, developed a smart campus, and built smart classrooms as national directives outlined, it has the autonomy to choose particular e-learning tools and LMS of its preferences. As its funding is over-relied on government support, without a diversified investment path, insufficient funds for implementing e-learning in teaching and learning remain a concern. With some progress in innovative teaching and learning, the university

promotes blended and online learning. Yet, the lack of adaptive learning technologies displays partial alignment. Strongly aligned with Education Informatization 2.0, digital literacy training for students in AI-related skills is a great example. However, since professional development for faculty in digital literacy and pedagogic skills is less structured and assessment of students' digital readiness is absent, disparities in student engagement may continue to exist.

In a critical manner, this trend highlights a broader contradiction between institutional autonomy and national directives. University B's e-learning plan 2021-2025 strategically aligns with principles of Education Informatization 2.0, its discriminating engagement with particular aspects of e-learning initiatives suggests a pragmatic approach rather than full-scale adoption. The university's absence of partnering with private tech companies for co-developing e-learning tools and LMS, and its decentralized leadership indicates a missed opportunity to pool external funding and intelligence. Interestingly, the absence of international collaboration corroborates University B's priority for the local economy.

University B's e-learning policies mirror a discursive strategy that adopts an informative and descriptive discourse rather than a directive one, diverging from the authoritative language displayed in Education Informatization 2.0. This gentler communication approach may alleviate the burden to comply. Without addressing downsides of e-learning technologies, the policies centered on technocratic discourses

that place e-learning technologies as the engine of educational transformation. In addition, without questioning benefits of Education Informatization 2.0, e-learning policies of University B exhibit a legitimized tone delineating them as inevitable. In a similar vein, a neutral discourse in its policies highlights the pros of Education Informatization and silent the potential challenges or critiques. In contrast, discourses related to strategic alliance with industry partners are absent in policy text of University B. Highlighting Education Informatization as overwhelmingly beneficial and inevitable, pervasive tone reinforces stakeholder buy-in.

#### **4.5.3 University C (Partial Alignment)**

University C exhibit a fine-tuned balance between Education Informatization 2.0 and its e-learning policies, reaching a partial alignment with the tenets of Education Informatization 2.0. The institution deliberately adopt national directives (Smart campus and classrooms, Data-driven decision making, and IT infrastructure expansion), but retain its autonomy in LMS selection, procurement of e-learning tools, and pedagogical use of technologies. The university distributes CIO's responsibilities over several departments such as Faculty's professional development center and Division of Network and Education Informatization. Its engagement in public-private partnerships upgrades its IT infrastructure, but the absence of diversified investment in university funding showcases its preference for financial independence. Funding strategies prioritize internal budgeting over government-directed financial models, albeit pedagogical innovation thrives in blended learning and student-centered

approaches but lacks adaptive learning models. In a similar vein, digital literacy initiatives are open to students and faculty, albeit participation remains voluntary, thereby the effectiveness of training programs remained restricted and these initiatives do not guarantee universal competency. In contrast, the lack of international collaboration corroborates University C's insist on serving the local economy.

There is a contradiction that could hinder long-term development of e-learning initiatives between its approach and national directives. The decentralized leadership structure, though retaining autonomy, may create inconsistencies in implementing e-learning strategies across departments. Although the university has flexibility in pooling and managing financial resources, the absence of diversified investment strategy, particularly from private-sector partnerships, could constrain its ability to sustain large-scale e-learning initiatives across all the departments.

Directive language falls under partial alignment, as University C's e-learning policies employs authoritative and directive vocabularies in a moderated level. In contrast, discursive language of University C's e-learning policies exhibit that with exception of one criterion-directive language, its policies fully align with three Discursive Types (technocracy, legitimacy, neutrality), and one Text Genre (persuasion) of Education Informatization 2.0. These discourse strategies extraordinarily position e-learning as the key driving force of educational transformation, strengthen Education Informatization as an unquestioned necessity, identify Education Informatization 2.0

in a universally beneficial position, and use pervasive tone to frame e-learning technologies as inevitable. Collaborating with external partners, however, mirrors only partial alignment with the corporatism, as industry partnerships upgrade digital infrastructure but co-developing e-learning platforms is absent.

#### **4.5.4 University D (Full Alignment)**

E-learning policies of University D exhibit a robust alignment with Education Informatization 2.0, but its policies maintain a level of autonomy in some areas. The institution aligns with national directives in structured governance, institutional leadership, public-private partnerships, and technology adoption, albeit its flexibility in course design, LMS selection, faculty's professional development, and students' IT literacy mirrors partial alignment. The presence of leadership roles ensures the integration of e-learning strategies into educational reform, and the vice-chancellor, appointed CIO, is in charge of driving e-learning initiatives across all the departments. University D's engagement in public-private partnerships is fully aligned with Education Informatization 2.0 because the institution collaborates extensively with private firms for e-learning infrastructure but adopts a diversified investment approach including the private and public sectors. The absence of international collaboration at the university, however, exhibits its misalignment with Education Informatization 2.0, but this absence corroborates its institutional priority-serving the local economy.

The university meets the required technological advancement of Education Informatization 2.0, including LMS, AI-driven education, and data-driven decision-making, but retains autonomy in selecting LMS vendors and e-learning strategies (partial alignment). Pedagogical innovation falls under partial alignment, as it is evident in its adoption of blended learning, AI-driven assessments, and smart classrooms, yet an adaptive learning approach is absent. In contrast, digital literacy initiatives at the institution indicate partial alignment with Education Informatization 2.0, as there is no assessment of students' e-readiness, which could impede students' engagement in e-learning activities when the information about the technological preparedness of students is absent.

Despite its augmented alignment with principles of Education Informatization 2.0, University D's autonomy implies that there is a flexibility for decentralized decision-making. This level of autonomy could foster innovation tailored to institutional needs. Furthermore, as University D upgrades e-learning technologies and IT infrastructure to meet technological requirements, the lack of mandated systems stated in its e-learning policies exhibits partial alignment in the criterion of technology adoption. Pedagogical innovation, though progressive, remains incomplete without adopting an adaptive learning approach, which is critical for meeting the personalized needs of students at scale.

E-learning policies of University D mirror a strategic use of discursive strategies that

mostly align with Education Informatization 2.0. Discourses of University D's e-learning policies indicate that the policies fully align with three Discursive Types (technocracy, legitimacy, neutrality), and one Text Genre (persuasion) of Education Informatization 2.0. This notion indicates that the policy text considers e-learning technologies as an inevitable and unquestioned necessity, solidifies the authority of Education Informatization 2.0 without critical evaluation, positions e-learning technologies as an objective and universally beneficial approach, and employs persuasive rhetoric to value e-learning technologies as revolutionary. In contrast, favouring suggestive and strategic wording, the discourse framing employs restricted use of directive terms, reaching partial alignment. However, the university's collaboration with private technology providers mirrors only partial alignment with the corporatism criterion.



#### **4.6 The role and the influence of stakeholders**

As what have been discussed in the section of 4.2.3, various groups of actors have been involved in the policy-making process at four academic HEIs. Table 4.15 shows a comparative study of stakeholder maps at four academic HEIs, displaying the influence of stakeholder on policy formulation.

Table 4.15 Comparison of stakeholder maps at four academic HEIs

Criteria	University A	University B	University C	University D
Key Players	The General Committee of the University (GCU)	GCU Administrators	Board of Directors GCU	Board of Directors CPC Committees
Context Setters	Academic Committee Administrators Department of Education/MoE	Academic Committee Department of Education/MOE.	Administrators (Department heads & Deans)	Administrators (Department heads & Deans)
Crowd		IT Specialists		
Subjects	Students Faculty IT Specialists	Students Faculty	Students Faculty IT Specialists	Students Faculty IT Specialists

Source: Author's own work

#### 4.6.1 Stakeholder involved in e-learning policy decision-making

Discoveries from University A indicate that one group, The General Committee of the University (GCU), consisting of top management, dominates the decision-making authority. The following figure displays the level of power and interest that various groups held, dictating how these groups are classified (See Figure 4.7).

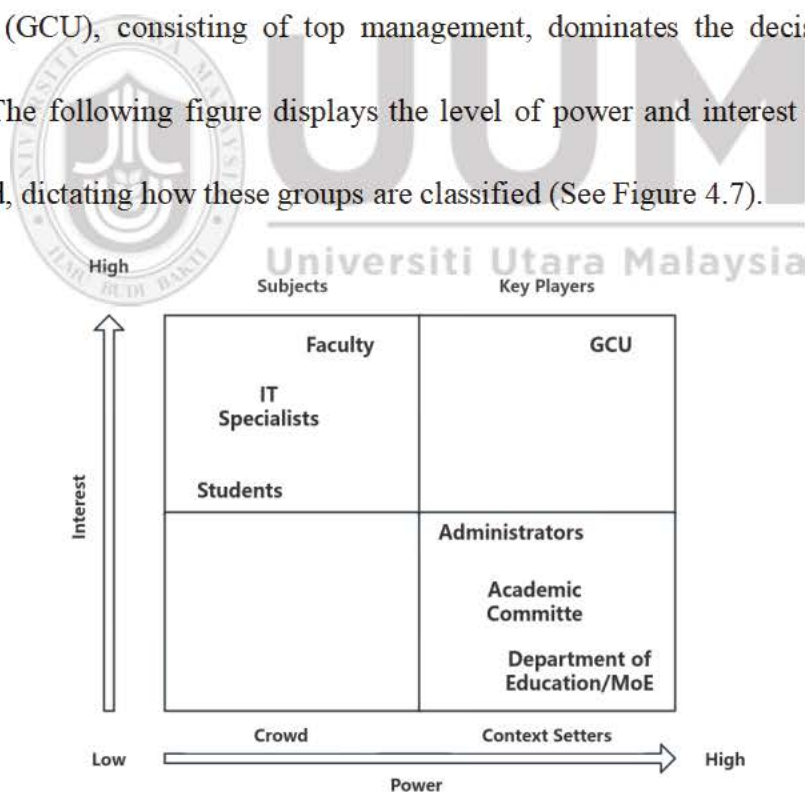


Figure 4.7 Stakeholder Map of University A

Source: Adapted from Mendelow (1991)'s Stakeholder Matrix

Administrators, including department heads and deans, are context setters who have power based on their managerial position. They are responsible for refining the

policies rather than initiate or veto them. Students are kept informed about the policy through Campus App, University Portal, and University Website. The involvement of IT specialists in policy-making is absent, and this indicates why they are classified as subjects. Faculty, though consulted for feedback, lack the decision-making authority. A number of faculty respondents noted their feedback on the drafted policy:

*Our feedback on the drafted policy are collected, and then will be firstly evaluated by Department heads and Deans. Normally, many of our recommendations are refuted and remarked as not practical or little value by deans. Mostly, our thoughts are regarded as symbolical rather than constructive (Faculty, University A).*

Faculty at University A perceive that their inputs are considered as symbolical rather than constructive, and this risk causes disengagement and resistance. Students, on the other hand, are not involved in the feedback loops on institutional e-learning policies:

*When it comes to collection of feedback on institutional e-learning policies, there are no regular surveys or interviews held by the university, and there are no communication channels to convey our feedback on digital literacy workshops, IT infrastructure, and LMS (Undergraduates, University A).*

Students indicate their lack of involvement in policy-making meetings or workshops.

Findings from University B display that two groups, The GCU and Administrators, dominate the decision-making authority. The following figure shows the level of power and interest that different groups held, determining how these groups are

classified (See Figure 4.8).

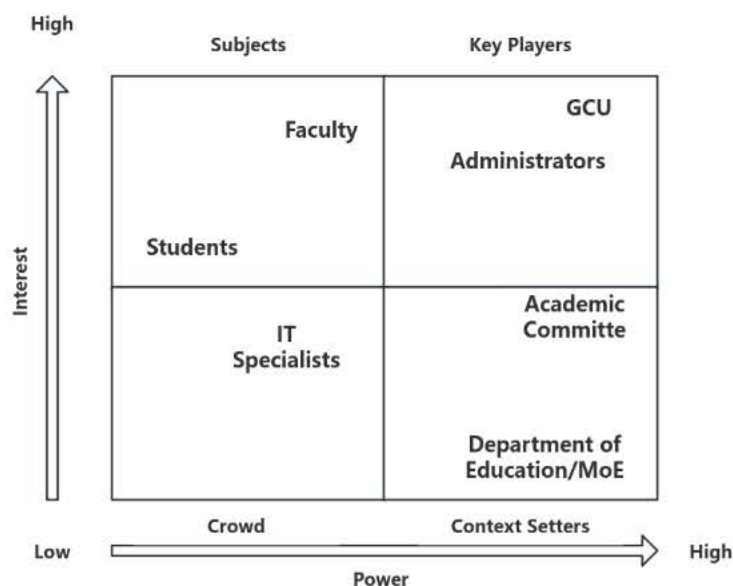


Figure 4.8 Stakeholder Map of University B

Source: Adapted from Mendelow (1991)'s Stakeholder Matrix

Unlike administrators at University A, administrators of University B initiate debate for identifying problems, supervise the drafting, and dominate the decision-making authority. Students are regularly informed about the policy through campus app and and Portal. The academic committee and Department of Education/MoE, who influence and evaluate policies at the stage of refining, are context setters. Faculty, though inquired with feedback on the initial draft, lack the influence on the policy-making process. Faculty comment on how their feedback on the drafted policy are collected:

*In general, we are required to provide feedback on drafted policies in written statement. Without communicating face-to-face, our perspectives present in a fragmented way, leading to no consensus. In many cases, our feedback on the drafted policies are not taken seriously by the authority since our feedback on the drafted policies is in the late-stage, which frames our inputs as*

*reactive rather than proactive, leaving no room for big change (Faculty, University B).*

IT specialists' influence, on the other hand, in policy-making is restricted, and their role is concentrated on technical support rather than strategic input.

*Generally, we are not included in the process of feedback loops on institutional policies related to e-learning initiatives or e-learning plan. Instead, we report information whether an e-learning system is technically robust or whether the existing IT infrastructure can support this e-learning tool to the administrators (IT specialist, University B).*

Students are not directly involved in policy-formulation process. Their voice regarding e-learning is normally collected through course rating.

*Sometimes, the e-learning platforms changes or there is no up-to-date guidelines for adapting to new e-learning technologies. It would be perfect if our university can interview us for knowing what works best for us before making important decisions. The course rating did not give us a voice but seemed like a formality (Undergraduates, University B).*

Findings from University C demonstrates that two groups, the board of directors and GCU, predominately possess the decision-making authority. The following chart indicates various level of power and interest that different categories held, determining how these segments are categorized (See Figure 4.9).

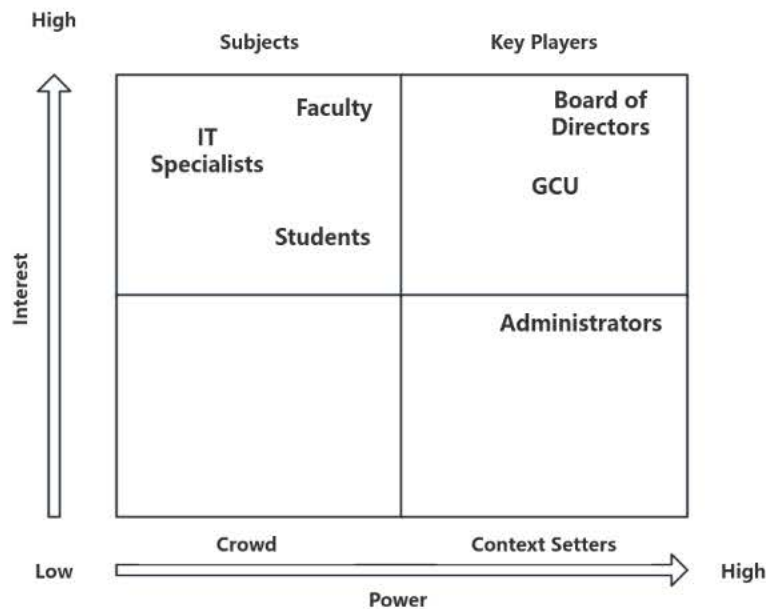


Figure 4.9 Stakeholder Map of University C

Source: Adapted from Mendelow (1991)'s Stakeholder Matrix

Although administrators make contributions to problem identification, and providing alternative plans, the decision-making authority rests with the Board of Directors and GCU. Institutional e-learning policies are publicly disclosed on the university website, but students are not informed to review these policies. Unlike public universities A & B, University C is self-funded. The Board of Directors hence dominates the decision-making power, with the intelligent input of the GCU. Faculty is not directly involved in policy-making process but some faculty with leading performance in adopting e-learning technologies in teaching and learning serve as representatives of all faculty. These representatives' voice carries more weight on providing feedback, which is collected by the Faculty's Professional Development Centre. However, the administrators, who are in charge of this center, serves as context setters.

*Although faculty representatives are proponents of digital literacy training, or providing more autonomy in utilizing e-learning tools, it seems like their experience and recommendations are only seriously valued when they have a*

*match with what the administrator already have in their brain. There is a strong indication that they endorse extant plans rather than shape new ones (Faculty, University C).*

IT specialists' influence, on the other hand, in decision-making process is limited, as they lack communication channels to make their voices heard by the Board of Directors. Their feedback are always filtered through administrative layers.

*We hand reports to department heads, but we seldom get feedback from the Board of Directors or GCU. When our technical reports reach the leadership, they are always trimmed down to focus on institutional priorities, not the actual tech needs (IT specialist, University C).*

Students' voice in policy-making process are missing, indicating that their voice is indirectly collected through course evaluation or satisfaction surveys, and the information is not taken into account while formulating or updating e-learning policies.

*I provided feedback about adding rich and up-to-date interactive content to hybrid courses, yet I only got a auto-responding e-mail thanking me (Undergraduates, University C).*

Discoveries from University D (See Figure 4.10) exhibit that two cohorts, the Board of Directors and CPC Committees, share the ownership of the decision-making authority. The following graph mirrors various level of power and interest that different groups held, displaying how they are categorized. Unlike University C,

University D involves CPC Committees, indicating its alignment with party-led governance approach.

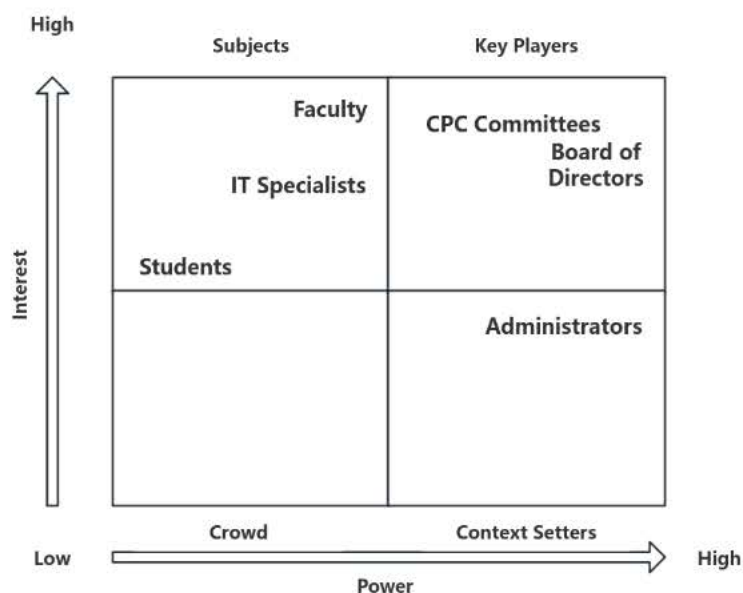


Figure 4.10 Stakeholder Map of University C  
 Source: Adapted from Mendelow (1991)'s Stakeholder Matrix

Faculty are not directly involved in the policy-making process but rather they are consulted with feedback for large-scale investment in e-learning technologies. However, in some cases, their feedback on the selection of e-learning technologies are not taken.

*Although administrators say they place our feedback as a valuable asset, the final call did not reflect what we said. For example, we expressed our needs for a system that support with premium analytic to tract student progress, but they prioritized standardization over discipline-specific needs (Faculty, University D).*

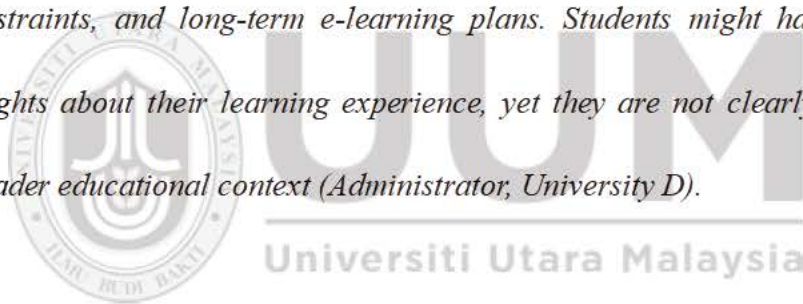
IT specialists, on the other hand, are not directly involved in policy-making process. They are consulted with feedback on the large-scale investment in IT infrastructure and e-learning technologies procurement. However, their IT expertise are undervalued

by administrators.

*The administrators consider us as the technicians, and they believe that we are experts of making systems running smoothly, but we are not necessarily aware what make an effective e-learning environment (IT specialist, University D).*

Students are kept informed about the policy through orientations, workshops, and teaching assistants. Students' voice are silent in the policy-making process. The policy-making process contains complexities and multi-layers of regulations, budgets, and strategic objectives, which they may not fully understand.

*Policy-formulation requires navigating a web of regulations, budgetary constraints, and long-term e-learning plans. Students might have in-depth insights about their learning experience, yet they are not clearly aware the broader educational context (Administrator, University D).*



#### **4.6.2 Stakeholder Engagement and Dialogue Processes**

According to Pedersen (2006)'s framework, which has been discussed in the section 2.11.2 of Chapter II Literature Review, stakeholder dialogue of University A indicates a highly hierarchical structure. Inclusion in the dialogue process is low, as faculty, IT specialists, and students are excluded from initial stages. Openness is restricted, as faculty provide feedback to predefined questions at later stages and students' voices are absent due to no formal channels. Owing to the fact that faculty feedback is frequently considered as impractical and alternative perspectives, such as students and IT specialists, are absent, the level of tolerance is low. Empowerment is minimum

level, as the GCU dominates the decision-making authority, rendering faculty input to a symbolic gesture. Transparency is relatively moderate, as students are kept informed through digital platforms but without detailed explanation.

Stakeholder dialogue of University B displays a hierarchical structure. As the decision-making authority is centered on senior administrators and top management and faculty, students, and IT specialists are not involved in initial stages of discussion, the inclusion is low. Consider the fact that faculty's written feedback on drafted policies, and students' voice is restricted to course ratings, openness is low. Tolerance is also low, with faculty's feedback not seriously taken, and IT specialists' role confined to technical support rather than strategic insights. Empowerment is very low, as the authority only remains with top leadership. Transparency is relatively low, as students obtain updates on apps but they have no access to detailed explanation.

Stakeholder dialogue of University C exhibits a hierarchical structure. The inclusion is low, as the decision-making authority remains with the Board of Directors and GCU, and faculty, IT specialists, students are absent from essential decisions. Openness is restricted, as faculty's input is filtered by administrators and students' feedback are collected through surveys, which do not affect policies. Tolerance is low, as only reflections that support existing plans are valued, and different ideas are ignored. Empowerment is low, with faculty representatives having small influence, and IT specialists and students cannot convey their thoughts directly to top leadership.

Transparency is low, with policies updated on university's website, yet filtered feedback and poor communications prevent people from understanding how policies are formulated.

Stakeholder dialogue of University D exhibits a top-down governance structure. The inclusion is low. Faculty and IT specialists are inquired on large-scale e-learning projects, but their feedback is always undervalued. Openness is in the form of consultations, yet it follows institutional priorities rather than procedures of open-ended dialogue. Tolerance is low, as alternative perspectives, such as students and IT specialists, are not taken seriously. Empowerment is minimal, as non-administrative stakeholders have no decision-making authority in reaching final calls. Transparency is moderate, as students are kept informed through workshops, orientations, and their teaching assistants.

#### **4.6.3 Collaboration/Partnership among Stakeholders**

At University A, collaboration among stakeholders, such as administrators, faculty, and IT specialists, exhibits a fragmented structure. Administrators admitted that communication among these groups is inconsistent. Faculty convey their needs through administrators rather than IT teams.

*Without a sophisticated communication channel between faculty and IT specialists, misunderstanding emerge, and technical solutions often miss the mark in addressing teaching priorities (One Administrator, University A).*

Faculty members expressed frustration with the current state of collaboration, pointing out that institutional resources tend to prioritize high-achieving faculty. One faculty respondent explained:

*Most of us need support from IT specialists. Administrators often misunderstand our needs for digital literacy training and professional development, ignoring that different departments require distinct types of support. The IT team lacks the expertise needed to effectively support teaching and falls behind on emerging technologies. IT specialists also could not provide custom-made, practical training in technology and subject-specific, which would benefit students and us (One Faculty, University A).*

IT specialists, also, highlight worries about their role, revealing that there is a lack of professional development opportunities for pedagogical use of IT and their technical role.

*We are expected to support various tools — from the LMS to virtual labs — but we do not obtain sufficient professional development opportunities to keep up with emerging technologies or grasp how they can support pedagogical use of technologies. Without professional training, we have not too much to offer (One IT specialist, University A).*

Collaboration among stakeholders at University B has led to a collapse, owing to the fact that there are barriers to communication and a lack of understanding. IT specialists are always considered as a technical support role, not as collaborators in

driving e-learning technologies in teaching and learning. Faculty perceive that administrators place more weight on performance metrics than hybrid teaching. These thoughts strengthen misunderstandings and curb collaboration.

Faculty recognized that even though IT specialists are experts of IT technologies, they lack in-depth understanding of hybrid teaching methodology. Administrators is in favor of innovative teaching, yet faculty assume they lack insufficient technical guidance.

*We need both parties to constantly communicating with us, not just perceive we can figure it out ourselves (One Faculty, University B).*

IT specialists, on the other hand, indicate that their role is narrowed down to addressing technical problems rather than collaborating on long-term solutions.

*Faculty only come to us when there are technical issues. This makes it difficult to develop a collaborative relationship, and we seldom work together discussing pedagogical use of IT (One IT specialist, University B).*

Partnership among stakeholders at University C mirrors a pattern, which comprises inadequate communication, misaligned expectations, and a lack of robust support framework. IT specialists, faculty, and administrators work under unmatched expectations, leading to frustration in collaborating. Faculty often feel unprepared because they are the last to be informed about new e-learning tools and policies. IT

specialists are supposed to provide guidance and interpretation, but they do not think it is their role to fill this gap.

*We always feel unsupported when new e-learning tools and policies are introduced. IT specialists, expected to support us, stick to maintain IT infrastructure (Faculty, University C).*

The challenge lies in how IT specialists' job performance are graded. Administrators favor innovative teaching but do not integrate clarified duties on pedagogical use of e-learning tools into IT's job responsibilities. IT specialists' main duty is to maintain and upgrade university portal and websites, not to assist faculty in developing innovative teaching. Without adding clarified duties on pedagogical use of e-learning tools into IT's job responsibilities, they only perform their basic duties.

*Administrators do not put weight on integrating technologies and clearly define IT's role, and, hence, why would IT staff go beyond their duties. If this is not part of their job responsibility or directly related to their salary, IT staff will not take this seriously. We are left to work this on ourselves (Faculty, University C).*

One IT specialist's reply further corroborates the fact why their role does not include assistance in e-learning tools deployment and pedagogical use of e-learning technologies. The unclear clarification of what should external vendors do, and what are IT specialists' duties adds to the disconnect.

*Our university have developed a cooperation with a range of digital vendors*

*who supply e-learning services and tools, such as LMS and Cloud-computing. More importantly, they provide training, support, and large-scale maintaining and upgrading services. Normally, we help faculty fix technical issues on IT equipment. When it comes to how to address issues for pedagogical use of complex e-learning tools and platforms supplied by external vendors, we just need to transfer faculty's feedback to these vendors.*

*(IT specialist, University C)*

How faculty perceived IT staff's role, on the other hand, also widens the divide. Faculty treat them as technical support rather than partners in innovative use of technologies in teaching. This bias impede IT specialists' abilities to proactively participate earlier in the process and foster a conducive environment which help integrate technologies into teaching.

*We see resistance from faculty's embracing emerging technologies, but we barely have the opportunities to detail how these technologies could improve their teaching. We are more like a troubleshooter to them, not collaborators in instructional design (IT specialist, University C).*

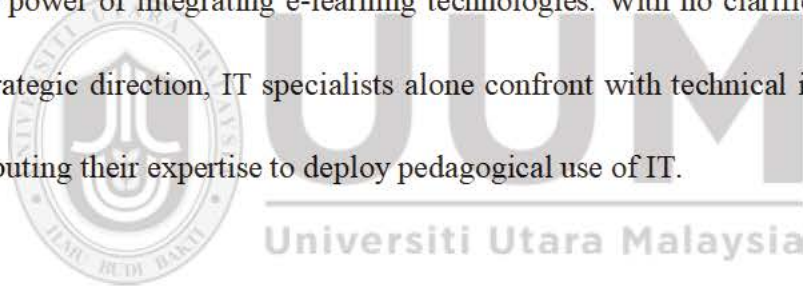
The inevitable force to drive innovation in teaching also brings pressure.

*We intend to encourage the use of emerging technologies in teaching, but faculty see these changes as extra workload. In the meanwhile, IT specialists are overwhelmed to drive these technologies and are more willing to perform their daily duties. We face backlash from faculty and IT specialists (Administrator, University C).*

Collaboration among stakeholders at University D displays a pattern, which involves undefined IT roles and misaligned expectations. One administrator acknowledged this trend:

*We do not clarify the role of IT specialists and what should they do when it goes beyond technical support. We do not have grasped the whole picture of how they should aid faculty with innovative teaching(One administrator, University C).*

This underscores administrators' limited understanding of IT staff's potential to harness the power of integrating e-learning technologies. With no clarified IT staff's role and strategic direction, IT specialists alone confront with technical issues rather than contributing their expertise to deploy pedagogical use of IT.



Faculty echoed the issues related to undefined IT roles, demonstrating limited support they receive from IT specialists.

*When new e-learning tools are introduced, though there are some training sessions, we are adopting these new technologies in teaching on our own. IT staff help us when things go wrong but they do not help deploy e-learning technologies in teaching. (One faculty, University D).*

This reply underline how faculty perceive IT' role as technical support rather than instructional design.

IT specialists, on the other hand, also acknowledged this problem:

*We are needed when something goes wrong, and most of them are technical issues. Especially, there is no one telling us what we suppose to support teaching beyond technical support. We are not get directly involved in discussion on how to harness the power of new technologies until there have been problems(One IT specialist, University D).*

This role indicates that IT specialists' abilities are confined to fixing technical issues, leading to disconnection among faculty, IT specialists and administrators.

To summary, while all four universities have confronted with a breakdown in partnership among stakeholders, they vary in the degree of fragmentation. University C struggled to provide clarified role for IT specialists, and this is exacerbated by relying on external LMS vendors. University D falls short of strategic vision or clarity on the role of IT specialists, resulting their passive involvement in collaboration. University A and B face breakdowns in stakeholder collaboration due to indirect and inconsistent communication, and inadequate understanding on roles of IT specialists. Under the broader sense, redefining roles of IT from technical troubleshooters to strategical partners, facilitating open communication, and develop joint efforts are needed.

#### **4.7 Financial Factors**

In this section, there are three financial factors related to status quo of how financial

decisions are made and implemented in practice across four universities. They are budgeting conflicts, investment priorities, and cost-effectiveness. While all universities strategically prioritize allocating financial resources to accelerate technology integration and innovation, they have faced challenges shaped by administrative priorities and competing demands for limited funding.

#### **4.7.1 Budgeting Conflicts**

As has been discussed in section 4.2.1 strategic focus of four universities, they all have shifted their focus from setting up IT infrastructure between 2016 and 2020 to technology integration and innovation between 2021 and 2025. The 2021-2025 e-learning plan at four universities all centered on introducing and adopting data-driven tools, and they frequently introduced new e-learning strategies, which encourage faculty to transition from one to another among various LMS vendors (SuperStar Learn, Rain Classroom, Treenity, U-Campus, and so on). Data from four universities all display that although they continue to work on building more smart classrooms, networked learning spaces, and data-driven platforms, they have completed the construction of fundamental IT infrastructure, such as building a smart campus and expanding campus-wide wireless network. Two aspects will be discussed in this section: Mismatch between Financial Investment and Institutional Needs & Policy Changes and Financial Inflexibility.

### *Mismatch between Financial Investment and Institutional Needs*

Findings from four universities all exhibit that as a large share of funding is allocated to building smart classrooms, networked learning spaces, and data-driven platforms, they lack funding distributing over the acquisition of e-learning tools, setting up emerging e-learning technologies, faculty's training needs for digital literacy and professional development, technology maintenance and upgrades, course design, and digital learning resources. Budgeting constraints have emerged as a nuclear challenge at four universities, and there are contradictions between administrative preferences and the practical needs of IT specialists and faculty. With a disproportionate rate of financial resources allocated to developing premium courses and acquisition of e-learning tools, conflicts are highly related to competing financial demands, which leads to underfunded areas including faculty training, technology maintenance and upgrade, and digital content development.

Data mining at four universities exhibit a pattern, where administrators prefer the development of premium courses. This inclination can help universities gain provincial and national recognition of first-class courses, which secure reputation gains and external funding from central and provincial government. This inclination, however, diverts financial resources away from faculty training, technology maintenance and upgrade, and digital content development, leading to an imbalance in e-learning development (See table 4.16). Faculty illustrated their frustration arise from a lack of consistent, subject-specific training opportunities (pedagogy-integrated

technology workshops & instructional design training), indicating that extant training programs are sporadic and insufficient to aid innovative teaching. This gap in faculty's professional development in digital literacy and pedagogical skills impedes their abilities to fully utilize LMS and e-learning technologies, undermining the efforts of online and hybrid teaching. IT specialists also reported that insufficient funding cause ongoing struggles to maintain and upgrade technologies. This problem leads to outdated e-learning platforms that diminish the overall learning experience. Faculty, in the meanwhile, reported a over-reliance on free, low quality e-learning material due to a lack of funding for purchasing prestigious e-learning material. This gap compromises the richness and interactivity of digital learning, therefore bringing dissatisfaction to both faculty and students.



Table 4.16 Budgeting Conflicts across Universities

Budgeting Conflicts across University A, B, C, D		
Emergent Theme	Prevalence Across Universities	Description
Competing Financial Priorities	Very Common (All universities)	Universities struggled to balance e-learning investments with other institutional priorities, leading to uneven financial allocations.
Limited Faculty Training Support	Very Common (All universities)	<i>Inconsistent and insufficient digital literacy training especially no custom-made workshops, hindering effective technology integration (Faculty).</i>
Digital Content Development	Very Common (All universities)	<i>A reliance on free, low-quality content due to insufficient funding for purchasing high-quality e-learning material(Faculty).</i>
Setting up Emerging e-learning technologies	Common (University A, B & C)	<i>Implementing emerging e-learning technologies such as AI and VR is not our immediate priority. To ensure these advanced platforms operate smoothly, we would first need to upgrade our existing IT infrastructure or invest in high-end systems — a significant financial undertaking. Additionally, acquiring AI- and VR-driven platforms comes with substantial upfront costs, accompanied by recurring expenses for maintenance and future upgrades, which places further strain on our budget. While we recognize the potential benefits of these technologies, we encourage faculty to explore free applications that incorporate AI and VR elements. Although we are aware that such resources may not fully address the diverse needs of our learners, this approach helps us balance innovation with our current financial limitations (Administrators).</i>
Course Design	Very Common (All universities)	<i>We are committed to developing premium courses (online/hybrid courses), as achieving recognition for provincial or state-level first-class courses brings substantial benefits. Securing such titles not only enhances our institution's reputation on a national scale but also increases the likelihood of receiving government financial grants. This recognition serves as both an academic achievement and a strategic investment, encouraging us to prioritize resources toward developing high-quality, competitive courses that align with these prestigious standards (Administrators).</i>
Technology Maintenance and Upgrade	Very Common (All universities)	<i>Due to budget constraints, we've faced challenges in keeping our e-learning systems up to date. Many platforms are running on outdated infrastructure, which impacts both performance and user experience. Delayed technical upgrades mean slower load times, compatibility issues with newer digital tools, and an overall less reliable learning environment. While we work to maintain system functionality, limited funding makes it difficult to implement necessary improvements, leaving us to prioritize immediate fixes over long-term enhancements (IT Specialists).</i>
Acquisition of e-learning tools	Very Common (All universities)	<i>We prioritize developing premium courses over acquiring e-learning tools. The demand for digital software varies significantly across disciplines, driven by each subject's unique learning objectives and skill development requirements. While we acknowledge that allocating financial resources to acquire subject-specific e-learning tools is necessary, we often seek more affordable alternatives to manage costs. For general skill training, we encourage faculty and students to explore free applications — though we recognize this as a temporary workaround rather than an ideal long-term solution(Administrators).</i>

(Very Common: mentioned by most participants across all universities; Common: frequently mentioned across three universities; Occasional: emerged in two

universities; Rare: only mentioned by a number of participants in one university)

Source: Author's own work

### *Policy Changes and Financial Inflexibility*

Four universities constantly introduce e-learning strategies, which involve transitioning from one to another LMS, adopting AI-driven tools developed by external providers, and integrating these new e-learning tools into teaching. Insufficient funding, however, hinders these strategic moves. Although universities want to keep up with the evolving nature of e-learning technologies, limited funding for faculty development, IT support, and technology maintenance and upgrades drag their pace down. IT specialists and faculty noted that strategic changes are always made with no adequate financial planning. This brought them constraints to adapt. The misalignment between strategic objectives and budgeting conflicts brings delays, inefficiencies, and operational challenges.

## 4.7.2 Investment Priorities

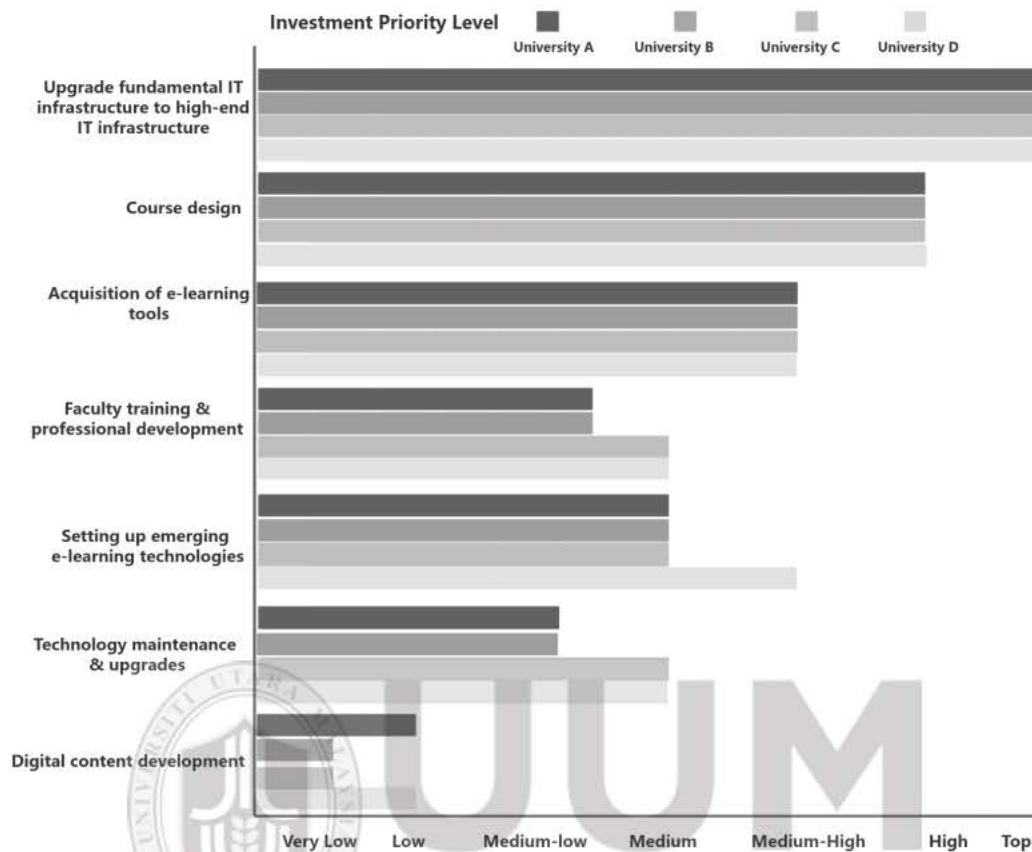


Figure 4.11 Investment Priority Level across Four Universities  
Source: Author's own work

Findings indicate a small degree of variance among investment priority level across specific categories at four universities (See Figure 4.11). It is obvious to see that investment priority level in categories of upgrade fundamental to high-end IT infrastructure, course design, and acquisition of e-learning tools exhibit the same pattern (See Table 4.17). And there is a slight difference among four categories at four universities: Faculty training & professional development, Setting up emerging e-learning technologies, Technology maintenance and upgrades, and Digital content development.

Table 4.17 Investment Priority Level among Specific Categories

Investment Priority Level among Specific Categories across Universities		
Category	Investment Priority Level	Common Issues
Upgrade to high-end IT infrastructure	Top Priority across all Universities	Large share of funds allocated to smart classrooms, network learning spaces, and data-driven platforms, but sustainability remains a challenge.
Course design	High across all Universities	Focus on developing premium courses to secure provincial/national recognition and government grants.
Acquisition of e-learning tools	Medium-High across all Universities	Priority is given to premium course development over acquiring tools. Subject-specific software needs vary, leading to reliance on affordable or free alternatives.
Faculty training & professional development	University A-Medium-Low University B-Medium-Low University C-Medium University D-Medium	Providing consistent, subject-specific training (e.g., pedagogy-integrated technology workshops & instructional design training at least twice a month) is costly. It requires hiring instructional designers and educational technology experts while addressing diverse faculty needs across different departments. Current training programs are fragmented, general, and lack long-term continuity, making it difficult for faculty to integrate technology effectively into their teaching.
Setting up emerging e-learning technologies	University A-Medium University B-Medium University C-Medium University D-Medium High	High upfront and maintenance costs require IT infrastructure upgrades first. Faculty encouraged to use free AI and VR applications as a temporary solution, but these resources may not fully meet diverse learning needs.
Technology maintenance & upgrades	University A-Medium-low University B-Medium-low University C-Medium University D-Medium	Outdated infrastructure causes slow performance, compatibility issues, and unreliable learning environments due to limited upgrade funding. IT teams focus on immediate fixes rather than long-term improvements.
Digital content development	University A-Low University B-Very Low University C-Very Low University D-Low	Over-reliance on free, low-quality e-learning materials due to a lack of funding for purchasing prestigious digital content. Many faculty resort to open-access or outdated resources, which may not align with the latest curriculum standards or provide interactive, engaging learning experiences. The absence of institutional support for acquiring high-quality course materials impacts both teaching effectiveness and student engagement.

(Investment Priority Levels: Top Priority, High, Medium-High, Medium, Medium-Low, Low, Very Low) Source: Author's own work

At all four universities (See table 4.17), upgrading IT infrastructure is the top investment priority, and promoting course design follows. As the 2021-2025 e-learning plan at four universities demonstrated, they keep allocating financial resources to building smart classrooms, networked learning spaces, and data-driven platforms. Owing to the fact that developing premium courses can help universities compete for provincial or national credentials and thereby acquire financial grants, all universities place course design as a high priority. We can see that the acquisition of e-learning tools are valued as medium-high priority at four institutions. Although this

investment, however, shows they are aware of the importance of e-learning technologies, they still place premium course development above acquiring e-learning tools, leading to widespread reliance on affordable or free alternatives.

Differences exhibit in three categories: faculty training and professional development, emerging e-learning technologies (such as AI & VR), and technology upgrades and maintenance (See Table 4.18). University C and D tend to place more weights on faculty training than A and B do. It is obvious to see University D value emerging e-learning technologies more than other three universities, despite all of them facing high upfront and maintaining costs. Owing to the financial flexibility, university C and D have autonomy to pool financial resources for technology upgrades and maintenance, whereas university A and B need to file a report for replacing all digital devices and waiting for financial approval.

Table 4.18 Responses from Four Universities

University Code	Responses from Interviewees
University A	<i>"Since all digital device replacements are pending financial approval, our interim strategy involves ongoing maintenance, repairs, and reallocation of retired devices from previous IT infrastructure upgrades to minimize disruption." (IT specialists)</i>
University B	<i>"We have submitted a formal report requesting approval for replacing outdated digital devices. Until financial approval is granted, we will continue maintaining existing equipment through repairs and repurposing retired devices from IT infrastructure upgrades where possible." (IT specialists)</i>
University C	<i>"Based on our policy, we can proceed with replacing outdated computers and digital devices as long as the total cost remains under ¥20,000. If the estimated expense exceeds this limit, we will escalate the request to the appropriate department heads or deans for approval." (IT specialists)</i>
University D	<i>"Our IT procurement guidelines allow for flexible replacements of outdated computers and digital tools if costs remain below ¥20,000. Any expenditure beyond this requires reporting and approval from department heads or deans before proceeding." (IT specialists)</i>

Source: Author's own work

A major gap (See table 4.19) among institutional disparities exhibits in digital content development, which is the least investment priority in all universities. Although university A and D value digital content development more than B and C do, faculty at four universities have to heavily rely on free, low-quality, or outdated materials. This gap significantly undermines the teaching quality and compromises students learning experience.

Table 4.19 Responses from Four Universities

University Code	Responses from Interviewees
University A	<i>"Our university does not prioritize high-quality learning materials, leaving faculty reliant on free, outdated, or low-quality resources. This significantly hampers our ability to provide effective instruction and diminishes student learning outcomes." (Faculty)</i>
University B	<i>"Without institutional support for high-quality learning materials, faculty are left to piece together free or outdated content. This creates a major barrier to delivering engaging and effective instruction, ultimately compromising student success." (Faculty)</i>
University C	<i>"Our institution does not prioritize quality learning materials, making it difficult for faculty to deliver up-to-date and relevant instruction. Relying on outdated resources weakens course content and negatively impacts student learning." (Faculty)</i>
University D	<i>"With little emphasis on investing in quality educational resources, faculty are forced to navigate outdated or low-quality materials. This not only weakens our instructional effectiveness but also leaves students without high-quality and up-to-date learning material they need to succeed." (Faculty)</i>

Source: Author's own work

In this section, two emerging issues, financial investment in technologies & pedagogical alignment and limited financial resources for customization and adaptation of tools, across four universities will be interpreted.

Table 4.20 Financial investment in technologies & pedagogical alignment

Financial Investment in Technologies & Pedagogical Alignment across Universities		
Emergent Theme	Prevalence Across Universities	Description
Underutilization of E-Learning tools	Very Common (All universities)	<p>While forums exist in most LMS systems, we lack strategies to foster meaningful discussions beyond basic question-and-answer threads, leading to low student engagement(Faculty).</p> <p>Many of us want to blend in-person and online instruction, but without guidance on structuring hybrid courses, we end up with disconnected in-class and online components(Faculty).</p> <p>Tools for building multimedia content are available, but without design training, we often revert to PowerPoint presentations, missing opportunities for interactive content (Faculty).</p>
Ineffective Teaching & Learning Outcomes	Very Common (All universities)	<p>Many free case studies are outdated or regionally irrelevant. Without guidance on creating or sourcing better alternatives, we're stuck with generic examples that don't resonate with students (Faculty).</p> <p>Free platforms/apps are available, but they lack the advanced features or industry-relevant functions students need for portfolios — and we don't know how to bridge that gap (Faculty).</p> <p>We resort to free documentaries and public domain readings, but these often lack nuanced, up-to-date perspectives. Without content creation support, we struggle to make lessons more engaging(Faculty).</p>
Wasted Investments & Financial Imbalance	Very Common (All universities)	<p>Our smart campus infrastructure supports seamless online-offline integration — yet many faculty struggle to design hybrid courses that balance in-person and digital elements effectively. This results in fragmented learning experiences rather than fluid, optimized ones (Administrators).</p> <p>In smart classrooms, the lecture recording system can tag key moments, generate transcripts, and allow students to jump to important segments. Many faculty hit "record" without tagging content, resulting in long, unedited videos that discourage student rewatching (IT Specialists).</p> <p>We've seen smart classrooms equipped with interactive displays, real-time analytics, and collaboration tools — yet instructors often default to traditional lectures. Without targeted training, they stick to familiar methods, leaving advanced features untouched (Administrators).</p> <p>Flipped classroom setups with recording and streaming capabilities are widely installed, but faculty continue traditional lecturing methods; unsure how to redesign their lessons for blended delivery (IT Specialists).</p>

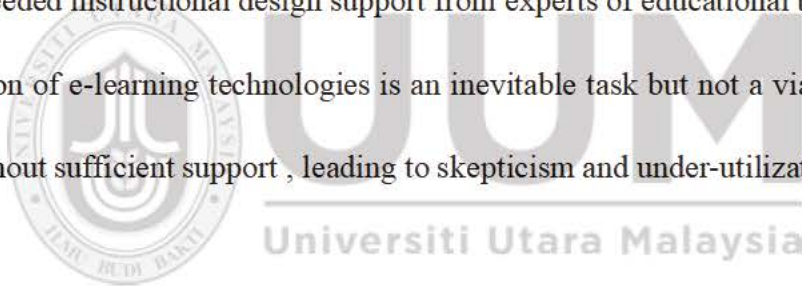
Source: Author's own work

*Financial investment in technologies & pedagogical alignment*

A salient challenge engendered by financial investment in e-learning initiatives is the divide between e-learning technologies investment and pedagogical methods. Even though all universities place greater value on IT infrastructure upgrades and e-learning tools, financial resources allocated to pedagogical support for the integration of e-learning are compromised (See table 4.20).

Interviewing faculty displayed a similar pattern at four universities. There is a pervasive disconnect between e-learning technologies investment and pedagogical use

of these e-learning technologies, centering on the absence of structured training and pedagogical framework. Four universities privilege high-end IT infrastructure and developing premium courses, but what faculty experienced is fragmented training sessions or vendor-led orientations that cannot address subject-specific pedagogical needs. Thereby, without structured pedagogical support, faculty face frustration, leading to under-utilization of e-learning tools. By and large, faculty at four universities disclosed that they choose to use fundamental features of e-learning tools or traditional teaching methods because they lack confidence using advanced features. In addition, although universities introduced interactive features, faculty perceived that they needed instructional design support from experts of educational technologies. The adoption of e-learning technologies is an inevitable task but not a viable task for faculty without sufficient support, leading to skepticism and under-utilization.



This under-utilization of e-learning tools has indicated a valuable lesson for improving teaching quality and institutional e-learning policies. Faculty responded that without structured pedagogical support, they can not fully master e-learning tools for achieving course objectives. Furthermore, budget conflicts coerced faculty to rely on generic, freely available digital learning resources. This reliance undermines student learning experience and compromises the quality of curriculum delivery. The imbalance in financial investment bring negative impacts that reduce the potential of e-learning.

*Limited financial resources for customization and adaptation of tools*

Four universities strategically outsource LMS services to LMS vendors (See table 4.21). This strategic move, however, fails to meet diverse teaching needs due to the fact that they lack funding and IT talents to develop a custom-made LMS platform. The major challenge is that standard LMS platforms can not adapt to diverse pedagogical needs of faculty who are from various disciplines, leading to reliance on less effective alternatives.

LMS platforms used in four universities are unable to integrate with external e-learning tools. Financial constraints provide no room for universities to incorporate professional third-party e-learning tools, including statistical analyzing tools used in social science and STEM fields, or simulation apps critical for technical subjects. Owing to this disconnect, faculty and students have to manually switch between platforms and e-learning tools, disrupting workflow and hampering learning efficiency. In addition, inflexible course design features impede pedagogical use of LMS platforms. Faculty are unable to tailor module structures to their specific subjects. They also cannot customize assignment formats, and progress tracking to cater to diverse learning needs. In the meanwhile, students face constraints with multi-media project submissions and inflexible deadlines, curtailing their opportunities to incremental learning. Briefly, LMS platforms lack of adaptability and they have no compatibility with external tools reduce the potential of e-learning

initiatives, highlighting the need for technology adoption strategies.

Table 4.21 Limited financial resources for customization and adaptation of tools

Limited financial resources for customization and adaptation of tools across Universities		
Emergent Theme	Prevalence Across Universities	Description
Limited adaptability	Very Common (All universities)	<p>Language learning benefits from interactive speaking and listening modules with AI feedback. The LMS offers only basic discussion forums, missing the interactivity needed for fluency development (Faculty).</p> <p>The LMS supports basic file uploads and quizzes but lacks the capability to embed real-time CAD (computer-aided design) simulations, forcing us to rely on external, less-integrated software (Faculty).</p> <p>We need dynamic environment simulations and decision-making scenarios for students to analyze data in real-time. The LMS only supports static case studies, reducing the experiential learning component (Faculty).</p>
Lack of integration with external tools	Very Common (All universities)	<p>We regularly use software like SPSS, Stata, or NVivo for data analysis in statistic-related courses. However, since these tools aren't integrated into the LMS, students have to manually export data, losing valuable time switching between platforms (Faculty).</p> <p>In medical imaging and diagnostics courses, software like RadiAnt or Caselt helps students interpret clinical data. Without integration, they must separately access these tools, disrupting continuity and reducing practical skill development (Faculty).</p> <p>Platforms like Jupyter Notebook, MATLAB, or PyCharm are essential for coding and data science courses. With no direct LMS link, students can't easily share code, troubleshoot errors, or receive feedback in one place (Faculty).</p>
Inflexible course design features	Very Common (All universities)	<p><b>Limited Feedback Options:</b> Feedback tools are basic — typically limited to generic text comments or numerical scores. We'd like to provide richer, more targeted feedback, incorporating audio comments, visual annotations, or personalized performance breakdowns, but the system doesn't support these options (Faculty).</p> <p><b>Lack of Personalization:</b> Every class is different, yet the LMS forces us into a standardized layout and structure. We'd like to customize module designs, assignment formats, or progress tracking to match our teaching style and student needs — but the system offers limited flexibility (Faculty).</p> <p><b>Rigid Assignment Submissions:</b> Some courses require multimedia projects — like videos, interactive presentations, or design portfolios — but the LMS only supports file uploads. We end up compressing or simplifying projects to fit the system, which ruins the quality of our work (Students).</p> <p><b>Inflexible Deadlines:</b> Some instructors want to offer flexible deadlines or let us revise assignments, but the LMS treats deadlines as final. Once something's submitted, we can't resubmit, even if we want to improve after feedback. (Students).</p>

Source: Author's own work

### 4.7.3 Cost-effectiveness

Data interpreting from four universities shares three cost-effectiveness concern. They are financial constraints on faculty training, ongoing maintenance and upgrades with limited funding, the imbalance between cost-effective tools and quality of learning. These three shared cost-effectiveness concerns jointly weaken long-run return on investment of e-learning initiatives at four universities.

Table 4.22 Financial Constraints on Faculty Training: A Cost-Effectiveness Concern

Financial Constraints on Faculty Training: A Cost-Effectiveness Concern		
Emergent Theme	Prevalence Across Universities	Description
Increased reliance on External Vendors	Very Common (All universities)	<p><i>The initial training was helpful for basic navigation, but teaching evolves. We want to learn how to integrate adaptive quizzes and multimedia assessments into our classes — but the vendor's training doesn't revisit those possibilities later (Faculty).</i></p> <p><i>The trainer explained how to create assignments but didn't discuss the 'why' behind different formats. We wanted to know how to build reflective, iterative design tasks for our students — not just how to create a generic submission box (Faculty).</i></p> <p><i>The cost goes beyond money — it's institutional knowledge, we're not just losing funds. We're losing opportunities to develop a self-sufficient, knowledgeable faculty body that can evolve alongside the technology. Without internal expertise, we're less adaptable and more vulnerable to vendor terms and pricing changes (Administrators).</i></p>
Widening Digital Divide Among Faculty	Very Common (All universities)	<p><i>Budgets for training are often tied to the cost of technology — so departments with advanced lab setups or simulation software get more support. Meanwhile, departments focused on critical thinking or writing-intensive courses, which need modern feedback tools, are overlooked (Administrators).</i></p> <p><i>Not everyone has the same tech comfort level. Some colleagues pick up new platforms quickly, while others struggle. Without structured training, this gap keeps widening, leading to uneven student experiences — even within the same program (Faculty).</i></p> <p><i>Younger faculty, especially those who grew up with digital tools, seem to adopt new platforms more easily. Many of us with longer teaching experience — but less tech exposure — feel like we're playing catch-up, which affects how modern our courses look (Faculty).</i></p>

Source: Author's own work

*Financial Constraints on Faculty Training: A Cost-Effectiveness Concern*

Training programs for faculty's professional development are underfunded at four universities. Although four universities grasp the importance of faculty's professional development in digital literacy and pedagogical skills and scheduled various training programs into their e-learning plans, financial constraints restrict the depth, frequency, and discipline-specific focus of training. Instead of consistent, structured faculty training programs, four universities adopted four types of generic training programs (See table 4.22). They are generic training session (provided by national smart education forums), orientation for using LMS platforms (less frequently provided by LMS vendors), training programs for incorporating emerging technologies (provided by Double-First-Class universities), and seminars for incorporating IT into teaching and learning (provided by guest professors). These training opportunities are either

inconsistent, lacking in-depth pedagogical strategies or not customized to cater to diverse faculty pedagogical needs.

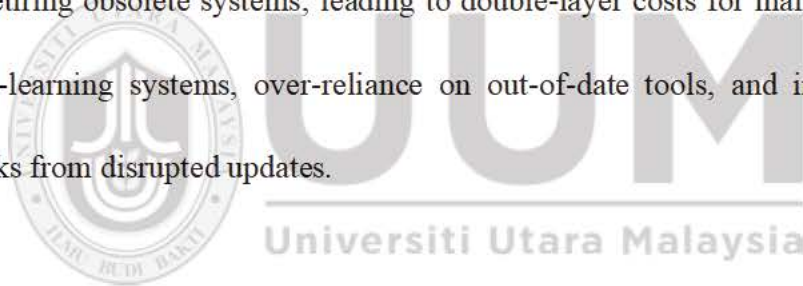
Another outcome of inadequate investment in training is that four universities increasingly depend on external vendors for faculty training. Owing to the fact that there are few in-house professionals and external vendors provide free training, four universities heavily rely on training provided by third-party vendors. Vendor-led training sessions appeared to focus on technical functions rather than pedagogical use of IT, resulting in a surface-level engagement with e-learning technologies. Therefore, faculty hardly master the skills required to integrate technologies into their teaching, and to address this gap requiring custom-made workshops with hand-to-hand mentor and further financial expenditure. Instead of building in-house expertise, universities heavily rely on external training programs. This strategic move places a long-term financial constraints on universities. Over-reliance on less effective external training programs and digital divide among faculty leads to uneven technology integration.

#### *Cost-Effectiveness in Ongoing Maintenance and Upgrades with Limited Funding*

There are three emergent themes arise from data mining related to shared cost-effectiveness concern for ongoing maintenance and upgrades confronted with financial constraints at four universities, and there is one emergent theme shared among University A and B. Three emergent themes across four universities are difficulty in predicting long-term maintenance costs, lack of clear decommissioning

strategy for obsolete systems, risk of over-reliance on legacy systems. Additionally, one emergent theme, shared among University A and B is lack of scalable infrastructure to support growth and upgrades (See table 4.23).

A serious concern among four universities is that they cannot precisely foresee ongoing expenses, which include licensing fees, security updates, and hardware replacement. Facing no robust, multi-year funding commitments, universities stretch the use of outdated systems, escalating operational costs and compromising their teaching quality. Exacerbating this concern, universities are underprepared to set up plans for retiring obsolete systems, leading to double-layer costs for maintaining old and new e-learning systems, over-reliance on out-of-date tools, and increased IT security risks from disrupted updates.



Due to financial inflexibility, University A and B face challenges in scaling their IT infrastructure and systems to accommodate growing student populations and e-learning needs. Extant IT infrastructure and systems of these University A and B are inflexible to incorporate up-to-dated e-learning technologies, causing fragmented e-learning platforms that not compatible with legacy IT infrastructure and leading to inconsistent performance. Although Universities C and D face financial constraints on large-scale investment in upgrading IT infrastructure and systems, they have relatively more financial flexibility to replace their digital devices on a small scale,

accommodating growing student populations and e-learning needs. Therefore, respondents at these two universities report no urgent need for scalable infrastructure.

Table 4.23 Cost-Effectiveness in Ongoing Maintenance and Upgrades with Limited Funding

Cost-Effectiveness in Ongoing Maintenance and Upgrades with Limited Funding		
Emergent Theme	Prevalence Across Universities	Description
Difficulty in Predicting Long-Term Maintenance Costs	Very Common (All universities)	<p><i>Our initial budget covers the purchase and setup of new technology, but ongoing costs — like software updates, technical support, and equipment replacements — are harder to predict. When these expenses inevitably arise, we're left scrambling for additional funds that weren't planned for (Administrators).</i></p> <p><i>When we propose new technology initiatives, securing one-time funding is feasible. However, getting multi-year commitments for upgrades, maintenance, and faculty training is much harder. This results in outdated systems still in use years past their effective lifespan (Administrators).</i></p> <p><i>When faculty report inefficiencies or IT warns about outdated infrastructure, we can't make a strong case for upgrades without updated cost-benefit data. This results in leadership choosing to 'make do' with the current system rather than risk new investments (Administrators).</i></p>
No Clear Decommissioning Strategy for Obsolete Systems	Very Common (All universities)	<p><i>When we delay retiring obsolete systems, the costs roll over into future budget cycles. This reduces funding for other priorities, like faculty training or innovative tech adoption, locking us into a reactive spending cycle (Administrators).</i></p> <p><i>Collaboration among us becomes fragmented. When some of us rely on different LMS, peer-led mentoring becomes harder. Some of us from various programs face compatibility issues, slowing down collaborative projects or shared modules (Faculty).</i></p>
Lack of Scalable Infrastructure to Support Growth and Upgrades	Occasional (University A & B)	<p><i>Every time enrollment grows, we face another costly upgrade. Our systems weren't built for growth. When we see even a modest increase in student numbers, there is not too much we can do. Either we're forced to expand servers or ask students to bring their own digital devices (IT specialists)</i></p> <p><i>Some classrooms are equipped for seamless hybrid learning, while others rely on older, incompatible setups. We end up troubleshooting during class, causing delays and affecting the learning experience (Faculty).</i></p>
Risk of Over-Reliance on Legacy Systems Due to Budget Constraints	Very Common (All universities)	<p><i>We're constantly firefighting instead of improving the system. Most of our time is spent troubleshooting bugs and performance issues rather than optimizing the platform or exploring new features — it's a reactive cycle (IT specialists)</i></p> <p><i>Departments start adopting third-party solutions to fill gaps left by the outdated system. This decentralizes spending and increases our overall technology costs (Administrators).</i></p>

Source: Author's own work

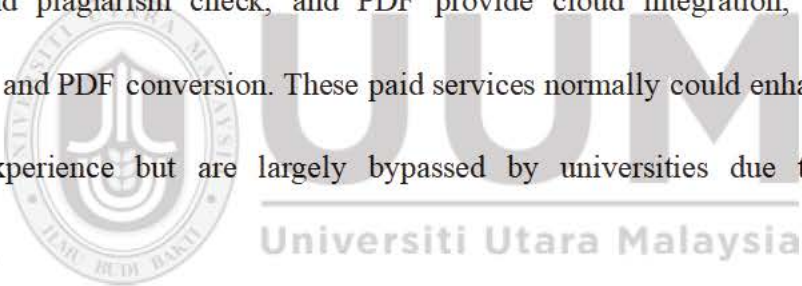
### *Cost-Effective Tools vs. Quality of Learning: A Cost-Effectiveness Challenge*

There are two emergent themes arise from data mining and they centered on imbalance between cost-effective tools and quality of learning at four universities.

Two emergent themes are following: prioritizing affordable or free tools that lack critical pedagogical and technical features, and over-reliance on open-source and free educational content. Two emergent themes mirror a pattern, showcasing that


institutional e-learning policies fail to address the imbalance between cost-effective tools and quality of learning (See table 4.24).

Using affordable alternatives or free tools reduce the benefits of e-learning technologies. Tools such as Capcut, and D-ID provide fundamental features, which are not critical for educational purpose. In a similar vein, the free version of some tools, such as Grammarly and PDF, provide entry-level services. The former one offers surface-level grammar check and the latter one offers entry-level service (basic annotation & limited conversion). However, paid version of Grammarly provides tone analysis and plagiarism check, and PDF provide cloud integration, E-signature workflows, and PDF conversion. These paid services normally could enhance student learning experience but are largely bypassed by universities due to financial constraints.



Institutional e-learning policies at four universities mandate the use of open-source platforms and free educational contents such as SmartEdu and the China MOOC platform. These platforms, however, lack engaging, industry-specific learning material tailored to student needs. This gap prompts students to seek contents on social media platforms such as Ticktok, Blibli, and RedNote. Although these platforms provide interactive and accessible learning, they are not designed for educational purpose and lack academic rigor and structured progression.

Table 4.24 Cost-Effective Tools vs. Quality of Learning:  
A Cost-Effectiveness Challenge

Cost-Effective Tools vs. Quality of Learning: A Cost-Effectiveness Challenge		
Emergent Theme	Prevalence Across Universities	Description
Select free tools that lack critical pedagogical and technical features.	Very Common (All universities)	<p><i>CapCut (by ByteDance) is great for quick edits, but not for serious instructional content. We can stitch together basic lecture highlights quickly, but without high-resolution exports or advanced editing controls, the final video quality isn't good enough for professional e-learning materials. It feels more like a social media clip than an educational resource(Faculty, University A).</i></p> <p><i>Hunyu3D-2.0 (by Tencent) is fast, but too generic. It's impressive how quickly it generates visuals from text and images — sometimes in under 30 seconds — but the output is often too generic or overly stylized to fit specialized subjects like science and engineering. We end up spending more time trying to adapt the visuals than creating useful content(Faculty, University B).</i></p> <p><i>Kimi or Doubao is helpful for brainstorming, but unreliable for factual content. Students use it to summarize topics and brainstorm ideas, but the free version doesn't access recent academic databases or peer-reviewed sources, which results in outdated or inaccurate information(Faculty, University B, C &amp; D).</i></p> <p><i>Some free learning platforms offer a wide range of content, but the material is often surface-level and designed for broad audiences. While it's easy to access and looks engaging, it lacks the depth needed for more complex subjects. This leaves students with only a basic understanding, and we have to spend extra time filling in the gaps to ensure everyone grasps the full picture(Faculty, University A, C &amp; D).</i></p>
Over-Reliance on Open-Source and Free Educational Content	 Very Common (All universities)	<p><i>SmartEdu Platform (by China's Ministry of Education) covers the basics, but feels outdated. The materials are state-approved, which gives students credibility, but much of the content is stale and doesn't reflect modern industry practices. We often have to create my own supplements to keep students engaged and informed (Faculty, University A, C &amp; D).</i></p> <p><i>China MOOC Platform offers free courses, but the delivery is too rigid. While the platform provides broad access to knowledge, the lecture-heavy style and lack of interactive features make it hard to hold our attention. We tune out or switch to more engaging platforms like Bilibili &amp; Douyin(Students, University B, C &amp; D).</i></p> <p><i>We learn a lot either from Bilibili, Today's Headlines, or Douyin because the content is fast, fun, and easy to follow — but it often oversimplifies things, leaving us with only a surface-level understanding (Students, University A, B &amp; C).</i></p> <p><i>Either Zhihu (Chinese Quora) or Rednote is great for seeing different opinions, but it's hard to tell who actually knows what they're talking about. There are so many answers, and sometimes they contradict each other — it's confusing to figure out what's reliable and what's just someone's guess (Students, University C &amp; D).</i></p>

Source: Author's own work

## 4.8 Technical factors

### 4.8.1 Technical Support Systems

There are three emergent themes arise from data mining and they centered on differentiated IT support needs for basic and advanced users. Three emergent themes are list as following: sufficient IT support for basic users, delays in problem-solving for advanced users, and discouragement of innovation in teaching and learning. Two out of three emergent themes mirror a pattern, showcasing that technical support

system at four universities fail to address the IT support for advanced users and support innovative teaching and learning (See table 4.25).

Four universities adopt one-size-fits-all approach addressing IT support for faculty and students. This approach can help tackle technical issues such as login problems, cloud storage errors, and navigation difficulties, guaranteeing routine e-learning practices run smoothly. For user who only use fundamental features of LMS platforms (uploading assignments, completing quizzes, participating in discussions, and tracking attendance and grades), IT support teams and help desk staff can streamline these routine tasks and provide sufficient technical support. Advanced users, however, face challenges when they explore and utilize complex features such as adaptive learning tools, data-driven grading systems, API integrations with external applications, and advanced analytics dashboards. IT specialists, who often lack the expertise to troubleshoot these advanced tools, always report issues to external vendors or address them on a case-by-case basis. This process leads to slower response times and creates inefficiencies.

This inefficiency largely prevent faculty from using innovative teaching methods and technologies. Also students, who intends to use complex features, feel unsupported and discouraged to engage with more advanced e-learning tools, restricting their opportunities for innovation in learning. Thereby, the failure to provide differentiated IT support impedes the full potential of universities' e-learning initiatives, stifling

both teaching and learning innovation.

Table 4.25 Differentiated IT Support Needs - Basic vs. Advanced users

Differentiated IT Support Needs – Basic vs. Advanced Users		
Emergent Theme	Prevalence Across Universities	Description
Efficient Support for Basic Users, Ensuring Day-to-Day Stability	Very Common (All universities)	<p>Faculty rarely explore beyond the basics, so our support stays streamlined. Even when the LMS offers more sophisticated options, most faculty stick to what's familiar. That makes troubleshooting simpler because we see the same types of issues repeatedly (IT specialists).</p> <p>Most faculty and students stick to basic LMS functions — and that keeps support manageable. Most users rely on straightforward tasks like uploading assignments, taking quizzes, or checking grades. Since these are routine processes, our help desk can quickly troubleshoot issues, ensuring classes continue without disruption (IT specialists).</p> <p>We prioritize stability for basic tasks because that's what most users rely on. Faculty provide an orientation to guide students on using subject-specific e-learning tools. As long as their core functions run smoothly, students are satisfied. We collaborate with vendors through online support groups to quickly address technical issues and ensure these essential features remain reliable and uninterrupted (IT specialists).</p> <p>Efficiency matters more than sophistication for most basic users. From an IT perspective, supporting the use of fundamental features of LMS is efficient. However, this reliance on simplicity leaves advanced educational technologies underutilized — which limits the LMS's full potential (IT specialists).</p>
Delays in Problem-Solving for Advanced Users	Very Common (All universities)	<p>Faculty using advanced analytics to monitor student engagement often report missing or inaccurate data. We troubleshoot locally, but deeper data issues require vendor intervention (IT specialists).</p> <p>With multiple LMS platforms in use, training help desk staff to handle complex, system-specific issues is tough. Staff may successfully troubleshoot Superstar Learn but lack the expertise to support advanced Treinity configurations, leading to fragmented support quality. We end up relying on faculty to describe their own issues, which leads to incomplete documentation (IT specialists).</p> <p>Faculty moving courses between LMS platforms report content misalignment, broken links, and missing assessments. We often spend hours troubleshooting migrated courses, but each LMS requires different fixes — making standardized solutions hard to implement. (IT specialists).</p>
Discouragement of Innovation in Teaching & Learning	Very Common (All universities)	<p><b>Immersive Learning Tools Left Unused</b> – Many faculty members are eager to integrate VR/AR platforms into their teaching to create more immersive, interactive lessons. However, frequent issues with software compatibility and complex device setup make it difficult to move forward. Without specialized IT support for immersive technologies, many of us feel discouraged and ultimately abandon these innovations, despite their potential to enhance learning (Faculty).</p> <p><b>Collaborative Whiteboards Abandoned</b> – We wanted to use advanced collaborative whiteboard tools for group projects because they seemed more interactive and efficient. But syncing issues between our devices and the e-learning platform made it too frustrating to keep using. In the end, we gave up and went back to basic document sharing — it's not as effective, but at least it works without constant glitches (Students).</p> <p><b>Data-Driven Assessment Tools Dropped</b>–We initially explored AI-based assessment tools to streamline grading and provide more personalized feedback for students. However, integration issues with our existing grading systems led to frequent syncing failures — meaning we often had to manually re-enter or adjust grades. What was supposed to save time ended up creating more administrative work, and many of us abandoned the tool after a few frustrating attempts (Faculty).</p> <p><b>Creative Presentation Tools Ignored</b> – We wanted to break away from boring slideshows and tried an interactive presentation tool, but file export issues meant we couldn't submit it properly. In the end, we stuck to PowerPoint (Students).</p>

Source: Author's own work

#### 4.8.2 Information Accessibility

There are three emergent themes arise from data mining and they centered on gaps in

information accessibility. Three emergent themes are listed as following: generalization of e-learning guidelines and faculty disengagement, lack of customized protocols for discipline-specific needs, and gaps in online library guidelines and library online resource utilization (See table 4.26).

Faculty at four universities indicated that e-learning guidelines designed for using LMS platforms are not clear and detailed, leading to disengagement with advanced features (discussion boards, analytical dashboards, and hybrid learning tools). Although e-learning guidelines for using LMS platforms exist, they do not specifically address faculty needs of using complex features.

An universal guideline to LMS protocols fails to accommodate diverse needs of various academic subjects. Faculty in different fields (mathematics, arts, and business) all face the homogeneous LMS guidelines, which barely align with their pedagogical needs. In fields that depend on peer learning, faculty face challenges in establishing framework-based peer feedback due to the lack of customized protocols designed for subject-specific needs. Faculty have to adopt makeshift methods (regular discussion boards), reducing the effectiveness of student engagement.

Students at four universities also experienced vague online library guidelines and no videos designed for navigating and exploring library online resources and databases.

They indicated that although university websites provide links and introduced

information about online databases, they are too vague and not useful for guiding them to use academic resources. This left them underprepared for academic writing.

Table 4.26 Gaps in Information Accessibility: A One-Size-Fits-All Approach

Gaps in Information Accessibility: A One-Size-Fits-All Approach		
Emergent Theme	Prevalence Across Universities	Description
Generalization of E-Learning Guidelines and Faculty Disengagement	Very Common (All universities)	<p>While LMS Platforms have group discussion features, setting up advanced collaboration spaces — like breakout rooms or joint project hubs — is poorly documented. Many of us revert to basic discussion boards, which limits student interaction (Faculty).</p> <p>LMS Platforms have data dashboards that could track student engagement and flag struggling learners early. But the instructions are vague, and IT support is limited. Most of us stick to manual grade tracking instead (Faculty).</p> <p>The guidelines suggest mixing synchronous and asynchronous learning but don't clarify how to structure content effectively. Faculty experimenting with blended formats often abandon them after encountering confusion and student complaints (Faculty).</p> <p>When advanced features malfunction, the guidelines offer generic 'restart and retry' advice. Without more in-depth troubleshooting steps, we often abandon these features rather than spending hours experimenting or waiting on external vendor support (Faculty).</p>
Lack of Customized protocols for Discipline-Specific Needs	Very Common (All universities)	<p>Teaching methods vary widely between subjects, but the LMS guides are too generic. A math professor using problem sets, an art instructor needing portfolio submissions, and a business lecturer running simulations all face the same basic instructions — which rarely meet our needs (Faculty).</p> <p>In education programs, we often use peer-teaching exercises and microteaching videos. There's no guidance on setting up structured peer feedback through LMS platforms — forcing faculty to create makeshift solutions with basic discussion boards (Faculty).</p>
Gaps in Vague library guidelines and Library Online Resource Utilization	Very Common (All universities)	<p>when conducting course assignments, students often cite outdated or incomplete analyses from free websites, unaware that the library offers premium databases like CNKI with current, detailed data (Faculty).</p> <p>Students frequently summarize information based on popular summaries or blogs, missing out on literature review journals available through online libraries. They do not know how to locate peer-reviewed analysis as they think library guidelines are too vague and not helpful at all (Faculty).</p> <p>We are getting overwhelmed trying to find empirical studies in our discipline, often ending up with opinion pieces or non-peer-reviewed content (Students).</p> <p>We rely on websites like Statista's free version or random blog posts, without specific guidelines, we do not know how to use online library for updated analysis and relevant databases (Students).</p>

Source: Author's own work

### 4.8.3 Technological Innovation and Integration

In this section, there are three critical issues related to status quo of how universities facilitate technological innovation and integration. While all universities strategically

aim to balance emerging technologies with institutional needs, they have faced challenges such as the innovation-integration paradox, a misaligned trajectory between technology innovation and pedagogical transformation, and redefining the role of IT specialists (from technical support to strategical partners).

*The innovation-integration paradox*

Data mining at four universities revealed that to integrate emerging e-learning technologies into teaching and learning face three challenges: systemic administrative delays, insufficient IT support, and lack of e-learning policies on emerging technologies. Slow administrative processes and few pilot programs postpone the integration of innovations (adaptive learning and immersive classrooms). Although sometimes faculty get new e-learning tools, they are poorly integrated (See table 4.27).

In addition, inadequate technical support exacerbates the resistance to use advanced e-learning tools. Either faculty encounter difficulties in analyzing and interpreting student data or they face challenges for utilizing complex systems. Without professional guidance and technical expertise, faculty fail to integrate innovations into their teaching.

That no detailed e-learning policies regulate the integration of emerging e-learning technologies into teaching add to the issue. The policy documents across four

universities stressed the importance of innovation, AI, and automation tools. References to support structure, however, are noticeably absent. Faculty hesitate to adopt innovative e-learning tools when they experience no strategic framework and institutional support on the use of emerging e-learning technologies such as generic AI, automation tools, or blending learning tools.

Table 4.27 The Innovation-integration Paradox

The innovation-integration paradox		
Emergent Theme	Prevalence Across Universities	Description
Rigid Administrative Structures	Very Common (All universities)	<p><i>Stalled Adaptive Learning Systems:</i> We proposed an adaptive learning platform to personalize student progress in my large lecture courses. It took six months just to get permission for a trial run — and even then, it wasn't a full version. The students didn't see the full benefits, and the administration used that partial success as a reason to drop it entirely (Faculty).</p> <p><i>Immersive Classroom Delay:</i> We've been hearing about immersive smart classrooms for years, but when we asked for VR integration to teach our courses more interactively, we were told it's a future plan. The future never seems to arrive fast enough, and students are missing out (Faculty).</p> <p><i>Superficial Adoption of New Tools:</i> When we do get new technology, it's often rolled out in such a limited way that it's pointless. We got an AI grading tool, but because it wasn't fully integrated into the LMS — and faculty weren't trained — most of us stopped using it. It felt like a box-ticking exercise for the university rather than real innovation (Faculty).</p>
Insufficient IT Support for Advanced Tools	Very Common (All universities)	<p><i>Big Data Analytics Left Untapped:</i> We've got access to student data that could improve engagement and retention rates, but no one knows how to configure or interpret the analytics tools. The IT team maintains the basics, but anything beyond that — we're on our own (Faculty).</p> <p><i>Failed Knowledge Graphs for Literature Review Training:</i> We wanted to guide students through complex literature reviews using a knowledge graph that maps themes and methodologies. IT couldn't handle the backend data parsing, so the visualization tool remained static and incomplete. We had to switch back to manual mind maps (Faculty).</p> <p><i>Dynamic Knowledge Graphs for Interdisciplinary Learning Faltered:</i> We proposed a dynamic knowledge graph connecting concepts across multiple disciplines — like environmental science linking to economics and ethics. IT could install the base program but couldn't manage the cross-database connections. The project stalled (Faculty).</p>
Unclear Policies on Emerging Technologies	Very Common (All universities)	<p><i>AI Content Creation Hesitation:</i> Many of us wanted to use an AI content generator to create supplementary lecture materials. But the university doesn't have guidelines on whether AI-generated content is considered 'authentic academic work' or if it needs to be disclosed. Without clarity, we avoided it (Faculty).</p> <p><i>Knowledge Graph Implementation Blocked:</i> We wanted to implement a knowledge graph to help students visualize complex concepts in our courses. The IT team couldn't support the setup or handle the system's backend, and without clear institutional support, the idea never materialized (Faculty).</p> <p><i>Blended Tools Confusion:</i> We wanted to combine our existing LMS with an AI-based engagement tracker to monitor participation. But since there's no framework on integrating external tools, IT said it's too risky. We ended up sticking to basic LMS functions (Faculty).</p>

Source: Author's own work

### *A misaligned trajectory*

The data mining from four universities indicated that they strategically aim to

integrate innovation in teaching, but its impact on teaching remains underwhelming. Because faculty are flooded with data that convey no actionable insights, they repeatedly see e-learning tools as administrative burden rather than teaching aids. Cutting-edge technologies such as virtual-reality-oriented platforms and smart classrooms are impressive but lack clarified connections to student learning. Faculty feel distracted and place these tools as secondary options (See Table 4.28).

Due to the fact that there is insufficient institutional support (technical knowledge, specific aids, and strategies), faculty are inclined to use basic LMS features rather than advanced ones. Albeit universities encourage mobile learning and personalized learning paths, faculty experience using these tools without strategic support. Adaptive learning tools demand technical expertise and instructional design support, which are not available to faculty. This leads to a surface-level engagement with emerging technologies.

As faculty feel discouraged to adopt advanced features, sensed unintuitive and lack clear benefits, this exacerbates the issue of under-utilization of emerging technologies. Although real-time collaboration function and learning analytic are embedded in LMS platforms, these features take precedence in classroom insights over administrative tracking. Without tailored training sessions and structured approach, faculty favour familiar, basic LMS features.

Table 4.28 A misaligned trajectory

Increased Workload from Pedagogical Shifts		
Emergent Theme	Prevalence Across Universities	Description
Faculty Burnout and Disengagement	Very Common (All universities)	<p><i>Instead of reducing our workload, e-learning often results in an increased need for content creation, online moderation, and digital communication with students (Faculty).</i></p> <p><i>Redesigning a course for blended learning takes far more time than just delivering a lecture. We feel that the additional effort required to develop engaging online content, such as videos, quizzes, and discussion prompts, is not acknowledged or compensated (Faculty).</i></p> <p><i>Our university should provide additional compensation, and workload adjustments to help manage the demands of student-centred learning (Faculty).</i></p>
Surface-Level Adoption	Very Common (All universities)	<p><i>Burnout is real—when every new policy adds more to our workload without reducing other responsibilities (Faculty).</i></p> <p><i>Our university wants data-driven teaching, but they don't consider the extra time it takes to analyze and apply student analytics (Faculty).</i></p> <p><i>I integrate multimedia when I can, but creating interactive modules requires more time than a simple PowerPoint upload (Faculty).</i></p> <p><i>We believe that LMS platforms should simplify teaching rather than add additional layers of complexity and responsibility (Faculty).</i></p>
Student Learning Compromise	Very Common (All universities)	<p><i>We're told to promote active learning, but if we only have time to upload PowerPoints and assignments, students just passively consume content (Faculty).</i></p> <p><i>Students expect dynamic online content, but with our current workload, we can't always deliver engaging materials beyond basic lecture slides (Faculty).</i></p> <p><i>Automated quizzes and multiple-choice tests are easy to set up, but they don't develop critical thinking the way interactive assignments do (Faculty).</i></p>

Source: Author's own work

### *Redefining the role of IT specialists*

The data mirrors a pattern at four universities, indicating that there is a gap between IT support and faculty needs in e-learning. IT specialists center on troubleshooting rather than assisting faculty incorporate technology into teaching. Without the involvement of IT specialists in course design, technology serve as an add-on, instead of as an powerful teaching tool (See Table 4.29).

Faculty frequently face constraints when they explore advanced LMS functions due to

the fact that IT transfers them to external vendors who develop the technology but not familiar with educational contexts. This misalignment negatively influenced faculty using technology for strengthening student learning experience. Support is disconnected among IT specialists who handle entry-level issues, external vendors who address complex technical problems, and faculty who request pedagogical use of technology. Neither one provides the instructional guidance faculty practically need. Faculty expressed their needs, repositioning the role of IT as a strategic partner, and guaranteeing technology enhances learning rather than becoming a roadblock.

Table 4.29 Redefining the role of IT specialists

Redefining the Role of IT in E-Learning		
Emergent Theme	Prevalence Across Universities	Description
From Technical Support to Strategic Partners	Very Common (All universities)	<p><i>IT as Problem-Fixers, Not Partners: Our IT team sees their job as fixing tech problems, not helping faculty innovate. If we're serious about modernizing education, IT needs to be involved in course design — not just maintenance(Faculty).</i></p> <p><i>Vendor Reliance, Faculty Frustration: When something goes wrong with advanced LMS features, IT immediately points us to the vendor. But the vendor doesn't understand our teaching context. We're left explaining pedagogical needs to tech support who only care about functionality, not outcomes (Faculty).</i></p> <p><i>Fragmented Support: We're caught between IT, who handles basic tech problems, and external LMS support, who handles advanced issues — neither really helps with what we need: integrating technology into our courses in a meaningful way(Faculty).</i></p>

Source: Author's own work

#### 4.9 Pedagogical Impact and Challenges

In this section, there are three critical issues related to status quo of how universities facilitate training for faculty's professional development in digital literacy and pedagogical skills. While all universities strategically aim to promote faculty's digital competency and shift focus from teacher-centered learning to student-centered learning, they have faced challenges such as a growing divide between faculty digital literacy and institutional e-learning policies, issues arising from pedagogical shift, and

faculty development needs.

#### **4.9.1 Faculty's Digital Literacy**

There are two emergent themes arise from data mining and they centered on faculty's digital literacy and pedagogical needs. They are listed as following: a growing divide between faculty digital literacy and institutional e-learning policies across all universities, and shifting towards needs-based policy design at University C.

##### *A growing divide between faculty digital literacy and institutional e-learning policies*

The data across four universities shared a pattern, exhibiting a gap between faculty digital literacy and institutional e-learning policies. To begin with, faculty face time constraints with learning e-learning tools. Also incentives or financial rewards are absent in institutional e-learning policies. Without financial incentives to explore advanced LMS features, most faculty use basic features of LMS platforms. Some faculty deploy engaging, and interactive content, while others rely on uploading PPT, online quiz and videos. This left students with varied learning experience (See table 4.30).

Institutional e-learning policies cannot address practical classroom needs. Generic training opportunities mandated by policies turn a blind eye on discipline-specific challenges, providing faculty with general knowledge that lacks practical approach. STEM and social sciences, for example, require distinct pedagogical methods, but

faculty experience the homogeneous training. No workshops provided for gradual skill development further encourages disengagement, owing to the fact that inconsistent training programs produce resistance rather than long-term engagement.

Unfortunately, training fatigue and disengagement further broaden the divide. Faculty are mandated to take repetitive, one-size-fits-all training sessions that fail to deliver in-depth insights for specific teaching needs. These training programs prioritize fixed LMS processes over adaptable teaching strategies, rendering faculty under-prepared to integrate technology practically. More personalized, hands-on mentoring programs and structured workshops could fix this gap, making faculty feel supported rather than overwhelmed.



Table 4.30 A growing divide between faculty digital literacy and institutional e-learning policies

A Growing Divide between Faculty Digital Literacy & E-learning Policies		
Emergent Theme	Prevalence Across Universities	Description
Uneven Technology Adoption	Very Common (All universities)	<p><i>Burden of Self-Learning: Most of our time are already spent on teaching and research. Learning a new digital tool feels like an extra burden, especially when there's no time allocated for proper training (Faculty).</i></p> <p><i>Lack of Incentives to Learn Advanced Features: There's no real motivation to go beyond the basics. The time investment needed to master these tools isn't acknowledged in our workload (Faculty).</i></p> <p><i>Inconsistent Use of E-learning Across Courses: Some faculty create engaging, interactive online courses, while others just upload assignments and PowerPoint slides. This means our learning experience varies greatly depending on who's teaching the class, making some courses far more engaging and effective than others (Students).</i></p>
Perception of Policy vs. Practice	Very Common (All universities)	<p><i>Generic training programs fail to address subject-specific needs: We are required to attend training sessions, but they do not address the unique challenges of our courses. Teaching STEM subjects in a hybrid model requires different digital tools and strategies than teaching social sciences, yet we all receive the same standardized LMS training, which often feels irrelevant to our specific needs (Faculty).</i></p> <p><i>Lack of gradual skill development leads to disengagement: Instead of forcing faculty into crash courses, why not offer ongoing mentorship and personalized support? That would encourage long-term adoption rather than short-term resistance (Faculty).</i></p> <p><i>Time-consuming training with little practical benefit: The training takes hours, but I walk away without anything I can immediately apply in my classroom. It feels like a box-checking exercise rather than meaningful professional development (Faculty).</i></p>
Training Fatigue and Disengagement	Very Common (All universities)	<p><i>We're taught rigid processes instead of adaptable strategies: The training tells us exactly how to use the LMS, but it doesn't let us explore how to adapt it for different types of courses. Teaching a writing-intensive seminar is very different from teaching a data-driven course, yet we all get the same instructions (Faculty).</i></p> <p><i>Every semester, we are inundated with generic training sessions from Double-First-Class universities, LMS vendors, and smart education forums. These sessions are time-consuming yet offer little practical value, as they follow a one-size-fits-all approach that overlooks our diverse teaching needs. Guest professors may showcase valuable examples of technology integration, but their brief, broad presentations lack the hands-on guidance needed for effective implementation in our own classrooms (Faculty).</i></p>

Source: Author's own work

### *Shifting towards needs-based policy design at University C*

As what have been discussed in policy-making process at four universities, faculty's voice at University C are absent in policy-making process. Respondents at University C showed their concern about not involved in policy design and their voices are ignored. This indicates a gap between top-down policy design and bottom-up involvement of faculty (See table 4.31).

Table 4.31 Shifting towards needs-based policy design at University C

Top-Down Policy Design vs. Faculty Pedagogical Needs		
Emergent Theme	Prevalence Across Universities	Description
Shifting Towards Bottom-Up, Needs-Based Policy Design	Rare (One university)	<p><i>We want a say in what technology gets adopted, not just be told to use it (Faculty, University C).</i></p> <p><i>We're not against technology, but we need time and support to use it effectively (Faculty, University C).</i></p> <p><i>Why not involve us in pilot testing before making a campus-wide decision (Faculty, University C).</i></p>

Source: Author's own work

#### 4.9.2 Pedagogical Shifts

In this section, there are two critical issues related to status quo of how e-learning plan at four universities shift their focus from teacher-centered learning to student-centered learning. They have faced challenges such as increased workload from pedagogical shifts, issues arising from pedagogical shift, and faculty resistance to a prescribed active learning methods.



#### *Increased workload from pedagogical shifts*

The data underscores the unintended consequences of e-learning policies. Additional work such as content creation, online moderation, and digital communication, no justified compensation or workload adjustments, has been introduced by e-learning as an alternative to streamline teaching. Universities fail to acknowledge the much greater effort needed to rebuild courses for hybrid learning compared to physical classroom teaching, leading to faculty burnout and disengagement. Without well-crafted institutional support, the intention to advocate student-centered learning is unattainable and unrealistic (See table 4.32).

Surface-level engagement with e-learning tools comes second, as e-learning policies

strategically aim to boost data-driven teaching but fail to consider the time-intensive nature of analyzing and applying student performance data. As building interactive modules is much more demanding than simply uploading PPT slides, faculty are less willing to employ multimedia content. Respondents of faculty indicate that rather than simplifying teaching processes, LMS platforms add layers of complexity, which makes teaching more complicated. Without sophisticated strategic guidance streamlining use of technology, faculty are constrained and unable to balance innovation with teaching practices.

Student learning is also compromised due to these restrictions. Although institutional e-learning policies advocate student-centered learning, faculty often have insufficient time and resources to develop engaging learning material beyond static lecture notes. This left students passively digesting content rather than proactively studying it. Multiple-choice quizzes and automated tests, though easy to undertake, fall short of fostering critical thinking abilities the way interactive assignments do. With no sufficient institutional support in faculty development and pedagogical needs, e-learning risks serving as a surface-level change rather than a driving engine for promoting education.

Table 4.32 Increased workload from pedagogical shifts

Increased Workload from Pedagogical Shifts		
Emergent Theme	Prevalence Across Universities	Description
Faculty Burnout and Disengagement	Very Common (All universities)	<p><i>Instead of reducing our workload, e-learning often results in an increased need for content creation, online moderation, and digital communication with students (Faculty).</i></p> <p><i>Redesigning a course for blended learning takes far more time than just delivering a lecture. We feel that the additional effort required to develop engaging online content, such as videos, quizzes, and discussion prompts, is not acknowledged or compensated (Faculty).</i></p> <p><i>Our university should provide additional compensation, and workload adjustments to help manage the demands of student-centred learning (Faculty).</i></p>
Surface-Level Adoption	Very Common (All universities)	<p><i>Burnout is real—when every new policy adds more to our workload without reducing other responsibilities (Faculty).</i></p> <p><i>Our university wants data-driven teaching, but they don't consider the extra time it takes to analyze and apply student analytics (Faculty).</i></p> <p><i>I integrate multimedia when I can, but creating interactive modules requires more time than a simple PowerPoint upload (Faculty).</i></p> <p><i>We believe that LMS platforms should simplify teaching rather than add additional layers of complexity and responsibility (Faculty).</i></p>
Student Learning Compromise	Very Common (All universities)	<p><i>We're told to promote active learning, but if we only have time to upload PowerPoints and assignments, students just passively consume content (Faculty).</i></p> <p><i>Students expect dynamic online content, but with our current workload, we can't always deliver engaging materials beyond basic lecture slides (Faculty).</i></p> <p><i>Automated quizzes and multiple-choice tests are easy to set up, but they don't develop critical thinking the way interactive assignments do (Faculty).</i></p>

Source: Author's own work

*Faculty resistance to a prescribed active learning methods*

The data underscores the unintended consequences of institutional e-learning policies, which is faculty resistance to prescribed active learning methods. One critical challenge is that flipped learning requiring students engaging with learning materials prior to class, yet many do not, leading to compromised learning outcomes. In addition, although universities advocate the value of project-based learning, faculty who teach in large lecture-based courses feel struggled to manage. The push for online and hybrid learning constraints faculty who reported that in-person interaction

is pivotal. Collectively, these challenges that faculty face make them perceive that their professional knowledge and teaching methodology are undermined by policy expectations (See table 4.33).

Surface-level adoption of student-centered learning comes second. Faculty are encouraged to allocate before-class readings and flipped learning tasks to students, but without using in-class Q & A, they hardly detect whether students truly complete tasks or not. To incorporate e-learning technologies has become a policy norm, but in many circumstances, it only leads to faculty uploading slides, online quizzes, and discussion panels. There is, however, no meaningful changes in their pedagogical approaches. This gap between policy goals and practical classroom realities leads to constraints for faculty who believe that shifting to active learning take precedence in meeting administrative objectives rather than genuinely improving student engagement.

Students perceived that the hybrid learning experience are always disjointed rather than integrated. Students face constraints with self-directed learning, but flipped and hybrid learning approaches require they can productively manage their progress in time. This lack of structured support could compromised students' learning outcomes. Also, students reported that hybrid courses are two separate experiences-online and offline part-rather than a cohesive learning journey. In the absence of approaches addressing the gap between instructional design and actual student needs, the value of

student-centered learning is undermined.

Table 4.33 Faculty resistance to a prescribed active learning methods

Faculty Resistance to Prescribed Active Learning Methods		
Emergent Theme	Prevalence Across Universities	Description
Undermined Professional Expertise	Very Common (All universities)	<i>Flipped learning assumes students come prepared, but many of our students don't engage with pre-class materials. Instead of improving learning, it just leads to more confusion(Faculty).</i> <i>Project-based learning sounds great in theory, but in large lecture-based courses, it's logistically impossible to manage without additional support (Faculty).</i> <i>We're being told to implement hybrid learning, but for courses requiring hands-on practice, there's no substitute for in-person interaction (Faculty).</i>
Surface-Level Implementation	Very Common (All universities)	<i>We're required to implement flipped learning, so we assign pre-class readings, but we are not sure whether students complete them or not. We have to take time to test whether they complete these pre-class tasks (Faculty).</i> <i>Hybrid learning is now a policy expectation, so we upload slides and a few discussion prompts to the LMS. But in reality, Our teaching remains the same as before (Faculty).</i>
Disjointed Student Experience	Very Common (All universities)	<i>Students often complain that hybrid course feels like two separate classes—one online and one offline—rather than a cohesive learning experience (Faculty).</i> <i>Some of our students struggle with self-directed learning, yet flipped and hybrid models assume they can manage their own learning effectively. In reality, many fall behind because they lack structure and guidance (Faculty).</i>

Source: Author's own work

#### 4.9.3 Challenges in Faculty's Professional Development

The data underscores the unintended consequences of institutional e-learning policies across universities, which are challenges in faculty's professional development (See table 4.34). Faculty at University A, C, and D reported that existing metrics are not fit for evaluating innovative teaching. With no professional knowledge and in-depth insights, they do not know where to begin and strive hard to improve their pedagogical design. This challenge is further exacerbated by the absence of sophisticated metrics designed for evaluating the pedagogical use of technology. Also consider that as there is no clear criteria benchmarking what constitutes effective or ineffective technology integration, faculty lack beacon lights on how to incorporate

e-learning tools into their teaching. This prompts faculty to navigate technology use based on intuition rather than informed strategies. Compared with University A, C, and D, faculty at University B report that University B has deployed some criteria for evaluating online and hybrid learning components. These benchmark are too broad, however, as they only assess whether faculty integrate LMS features or e-learning tools into teaching:

*The evaluation metrics evaluate the integration of e-learning into teaching but do not differentiate between faculty who seamlessly balance online and offline parts and those who merely use LMS platforms to check student attendance, quiz completion and log-in frequency (Faculty, University B).*

Compared with University A, C, and D, University B has made some progress and start to employ some criteria, though failed, evaluating integration of e-learning into teaching.

The gap between policy expectations and faculty preparedness comes second. Universities anticipate faculty to employ student-centered learning methods, yet some faculty report that their digital competency and pedagogical skills cannot reach these expectations. The push to integrate e-learning tools in their teaching burden their workload, leading to stress. Faculty responded that although training sessions introduce how to use e-learning tools in teaching, they lack guidance on how to use these tools effectively in their specific teaching context. In the absence of structure

support and workload adjustment, faculty wrestle to balance their existing work with the extra effort required to learn and deploy technology-enhanced teaching strategies.

Institutional e-learning policies forfeit providing faculty with explicit guidelines on which level of digital competency they need to reach or the particular pedagogical training goals they should meet. The conceptualization of faculty digital literacy remains vague and broad, informing faculty uncertainty about which set of skills they should develop. With the lack of well-established digital competency framework, faculty face constraints with adopting hybrid and student-centered learning models.

Table 4.34 Challenges in Faculty’s Professional Development

Challenges in Faculty's Professional Development		
Emergent Theme	Prevalence Across Universities	Description
Superficial Metrics vs. Meaningful Insights	Common (University A, C, and D)	<p><i>Institutional surveys primarily measure student satisfaction, teaching quality, and course content, but they do not specifically reflect actual hybrid learning outcomes(Faculty).</i></p> <p><i>We try to blend face-to-face instruction with e-learning, but there are no clear metrics to help us understand whether our approach enhances or hinders student learning (Faculty).</i></p> <p><i>We need assessments that track skill development, not just user experience: Rather than relying on course completion rates, we should measure whether students are improving in areas like digital research skills, analytical reasoning, critical thinking and online collaboration(Faculty).</i></p> <p><i>Without insights into what constitutes effective pedagogical use of technology, we are unsure whether our adjustments to online assessments and activities are improving learning(Faculty).</i></p>
Policy Expectations vs. Faculty Workload	Very Common (All universities)	<p><i>Attending training doesn't mean we're fully prepared: We sit through LMS training, but it doesn't address how to incorporate it into our courses effectively. The assumption that we can immediately apply what we learned is unrealistic (Faculty).</i></p> <p><i>Workload policies must reflect digital integration demands: If universities truly want us to innovate with technology, they need to adjust workload expectations, provide incentives, and offer structured, discipline-specific support (Faculty).</i></p>
Policy Expectations vs. Faculty Development Needs	Very Common (All universities)	<p><i>Unclear Digital Literacy Expectations – We are told to enhance our digital literacy, but without a structured framework, we don't know whether we should focus on basic tool usage, data analytics, or advanced instructional design(Faculty).</i></p> <p><i>Lack of Pedagogical Training Goals – While we are encouraged to use e-learning, we receive no guidance on what constitutes effective digital teaching methods, making it difficult to measure our progress(Faculty).</i></p> <p><i>Challenges in Student-Centered Learning – We want to implement interactive and personalized digital learning experiences, but without clear competency standards, we don't know which strategies will be most effective(Faculty).</i></p> <p><i>Ineffective Professional Development – Training workshops are offered, but they don't align with a structured competency model, making it difficult for us to track our skill progression(Faculty).</i></p>

Source: Author's own work

The Professional Development Center at University C (See table 4.35) strategically planned to build in-house expertise recently. The centre starts to send tech-savvy faculty, who have established premium courses or are experienced contestants in National Innovative Teaching Context, to participate in professional training sessions for integrating technology into teaching (The training fees for each faculty are expensive and usually last for at least 5 to 7 days), and expect them to become experts of educational technologies, and then form expert teams, undertaking training workshops, and providing pedagogical support and advises for instructional design. This initiative sounds promising but need further actions, such as structured incentives and sustainable policies, to secure its effectiveness.

Table 4.35 Build in-house Expertise

Challenges in Faculty Professional Development (Continued)		
Emergent Theme	Prevalence Across Universities	Description
Building in-house expertise	Rare (One University)	<p><i>The Professional Development Center's initiative ensures that we have in-house expertise, reducing reliance on external training and fostering long-term e-learning integration (Faculty, University C).</i></p> <p><i>By selecting experienced faculty for advanced training, we create a strong foundation for peer-to-peer mentorship, making innovative teaching more accessible (Faculty, University C).</i></p> <p><i>Having a structured plan to develop in-house expertise is a great step forward. However, the expectation that trained faculty will then support others effectively depends on their ability to translate what they've learned into practical, discipline-specific applications (Faculty, University C).</i></p> <p><i>Our university presents this initiative as a major step toward innovative teaching, but in practice, without sustainable policies and structured incentives, it risks becoming a short-term experiment rather than a long-term solution (Faculty, University C).</i></p>

Source: Author's own work

#### 4.10 Student Engagement and Learning Experience

In this section, there are two critical themes, and they are students' digital literacy, and student engagement and participation. While all universities strategically aim to promote students' digital competency and improve student learning outcomes, they

have faced challenges such as a divide between assumed readiness and actual competence, issues arising from blind confidence and unrecognized skill gaps, vague policy expectations and students' misconception of digital literacy, a gap between superficial metrics and meaningful insights, and uneven learning experience.

#### **4.10.1 Students' Digital Literacy**

The findings indicated a gap between assumed readiness and actual competence. Respondents report that they assume they possess adequate digital literacy but struggled to employ digital tools for data analysis, creating analytical charts and diagrams when they encountered research-based coursework. This gap is further compounded by students' overestimation of their digital competency. Faculty indicate that although students can navigate social media and the fundamental functions of e-learning tools, they have difficulties using document formatting, citation software, and data visualization.

The main contributing factor to this gap is vague expectations regarding digital literacy informed by institutional e-learning policies (See table 4.36). Students responded that they face frustration over the absence of clear guidelines profiling what digital skills they need to develop for their professional and academic path. Universities advocate innovation integration but fail to conceptualize what digital literacy entails. There is no structured learning path for upgrading students' digital literacy. Lack of direction and assessment of students' digital literacy provide no

insights about students' skill gaps. In addition, separating explicit competency frameworks custom-made for different disciplines from cultivating students' digital proficiency further exacerbates their difficulties in academic and research tasks.

Table 4.36 Students' Digital Literacy

Students' Digital Literacy		
Emergent Theme	Prevalence Across Universities	Description
Assumed Readiness vs. Actual Competence	Very Common (All universities)	<p><i>We didn't know how to create figures and graphics for our thesis: We assumed we could just copy and paste images, but our lecturers wanted us to create professional-looking charts and diagrams. I had no idea how to use digital tools for that, and I wish I had learned earlier (Students).</i></p> <p><i>We underestimated how much digital literacy we actually needed: We thought writing our thesis would just involve typing in Word, but then we realized we needed to use citation software, check formatting, and organize references properly (Students).</i></p> <p><i>Using data analysis tools was overwhelming: In our research course, we were required to analyze data using Excel and SPSS. I assumed my basic Excel skills were enough, but I quickly realized I didn't even know how to run a simple statistical test (Students).</i></p>
Blind Confidence vs. Unrecognized Skill Gaps	Very Common (All universities)	<p><i>Students appear confident using technology, but many lack essential digital skills: Many of our students know how to browse the internet and use social media, but they struggle with basic functions in word processing software, such as formatting, citation management, and document organization (Faculty).</i></p> <p><i>Thesis writing becomes overwhelming for students due to their lack of experience with digital research tools: When students begin their thesis, they often don't know how to use reference managers like Zotero or EndNote. They manually compile citations, leading to inconsistencies and formatting errors that could have been avoided with proper training (Faculty).</i></p> <p><i>Data visualization and figure creation remain significant challenges for students in research-based courses: When asked to create charts or figures for assignments, students often resort to screenshots from Excel instead of using proper data visualization tools. They are unaware of software options that would make their work more professional and clear (Faculty).</i></p>
Vague Policy Expectations vs. Student Misconceptions of Digital Competency	Very Common (All universities)	<p><i>There's no clear standard on what digital skills we need to master: We know digital skills are essential, and there's no detailed checklist or requirement that tells us what software or skills we should focus on for our specific major or career path but vague policy expectations (Students).</i></p> <p><i>The university promotes e-learning, but we have no guidelines on what 'digital literacy' actually means: We keep hearing that digital skills are essential, but there's no specific framework outlining what we're expected to know at different stages of our studies (Students).</i></p> <p><i>There's no roadmap for digital literacy—students are left to figure things out on their own: Instead of a step-by-step guide on mastering digital tools throughout our academic journey, we only realize our gaps when we struggle with undergraduate thesis (Students).</i></p>

Source: Author's own work

#### 4.10.2 Barriers to Student Engagement and Participation

The findings mirrors a shared pattern across four universities, indicating that three common themes contributing to curbing student engagement and participation. Three common themes are: the challenge of assessing student engagement, variability in faculty digital literacy and pedagogical skills, unequal access to smart rooms (See

Table 4.37).

Firstly, the roadblocks of measuring student engagement stem from the reliance on LMS data, including log-in frequency, forum participation, video completion rates, which do not precisely mirrors practical learning. Faculty reported that some students submit their assignments online at the last second or copy answers to reach task requirements, inflating LMS data without displaying practical comprehension. Faculty realized that these benchmark can be misleading, because they fail to snapshot whether students proactively engage with online learning activities. However, LMS data is first-hand to know what happens to student engagement.

Secondly, variability in faculty digital literacy and pedagogical skills brings uneven learning experience to students. When some faculty skillfully employ LMS platforms and e-learning tools, others revert to surface-level engagement with e-learning tools and rely heavily on teacher-centered pedagogy, making lectures less attractive. Participants also indicate that some faculty can not seamlessly balance online and offline learning, with over-reliance on one format reducing the benefits of others. Inadequately designed online learning activities, lacking interaction and explicit structure, further compromise student engagement.

Finally, uneven access to smart classrooms produce divides in student engagement.

These smart learning environments are featured with interactive layout and tools that

cater to various learning styles, prompting students stay concentrated and participate more proactively. The high student-to-classroom ratio at University A, B and C indicates that most students predominately experience traditional multimedia classrooms throughout their study. Faculty admit that although smart classrooms fostering positive learning environment for students, their limited numbers prevents widespread use.

Table 4.37 Barriers to Student Engagement and Participation

Barriers to Student Engagement and Participation		
Emergent Theme	Prevalence Across Universities	Description
Assessing Student Engagement: Metrics vs. Meaningful Learning	Very Common (All universities)	<p>Many students complete assignments just minutes before the deadline, which suggests they're rushing through the material rather than engaging with it meaningfully. The system records their submission, but it doesn't tell us whether they actually learned anything (Faculty).</p> <p>We've seen students post on discussion forums just to meet the minimum participation requirement. They often copy sentences from the readings or paraphrase classmates' responses, which inflates engagement metrics without real intellectual effort (Faculty).</p> <p>When we review LMS analytics, we cannot determine whether students are actively engaging with lecture videos or simply letting them play while doing other tasks. The system marks the video as 'viewed,' but this does not guarantee meaningful learning. Faculty highlight that video completion rates can be misleading indicators of student engagement (Faculty).</p>
Variability in Faculty Digital Competency and Pedagogical skills & uneven student learning experience	Very Common (All universities)	<p>Some faculty effectively integrate LMS platforms and e-learning tools, leading to engaging learning experiences, while others lack digital proficiency and revert to traditional, less interactive teaching methods. This inconsistency creates an uneven learning experience for us (students).</p> <p>Faculty often struggle to find the right balance between online and offline learning, leading to over-reliance on either format. Too much online content can reduce face-to-face engagement, while excessive offline instruction can neglect digital learning benefits(students).</p> <p>LMS platforms can definitely make learning more engaging, but it really depends on how well faculty use the interactive features. If the online components aren't designed well, the course can feel pretty passive and boring, which makes it harder to stay engaged(students).</p> <p>In some cases, it's hard to stay motivated or keep up with online learning activities, especially when there's not enough engagement or clear guidance. If the course isn't structured well with activities that get us involved, it can be easy to lose focus and fall behind(students).</p>
Unequal access to smart classrooms	Common (University A, B, and C)	<p>Smart classrooms are way more engaging than regular multimedia classrooms. They have tools that really cater to different learning styles, making it easier to stay focused and participate(Students).</p> <p>In a smart classroom, We feel more connected to the lesson. The technology makes everything more interactive, which motivates us to get involved in discussions(Students).</p> <p>With multimedia classrooms, the learning experience is kind of one-sided, but in smart classrooms, it feels like everyone can interact with the content, which helps me stay engaged. The problem is, we hardly ever get to be in a smart classroom—it's mostly multimedia for us (Students).</p> <p>While smart classrooms certainly offer a more engaging and interactive learning environment, the reality is that we rarely have the opportunity to use them. With the limited number of smart classrooms available, and the high number of students, we mostly conduct classes in multimedia classrooms, which are less interactive (Faculty).</p>

Source: Author's own work

However, participants at University D indicated that most courses for students are undertaken in smart classrooms, and the student-to-classroom ratio indicates that smart learning environments have capacity to meet the needs of growing student population (See Table 4.38).

Table 4.38 Responses from Respondents of University D

University Code	Responses from Interviewees
University D	<p><i>"Our university has upgraded more than 240 smart classrooms throughout the campus so far, and can cater to most students' learning needs" (Administrators).</i></p> <p><i>"Most of our courses are taken in smart classrooms. And throughout my study, these smart learning environments provide more engaging environment" (Students).</i></p> <p><i>"I can see how much more engaged students are in a smart classroom, where the technology supports active learning" (Faculty).</i></p>

Source: Author's own work

#### 4.11 Preliminary Cross-Institution Observation

The initial analysis of data mingling from four universities unraveled the myth about how institutional e-learning policies hinder or support e-learning integrating into teaching and learning in Chinese academic HEIs from an integrative perspective. In this section, shared challenges, institution-specific variations, and emerging patterns will be displayed.

##### 4.11.1 Shared Challenges & Institutional Disparities

Synthesizing research findings, the table has summarized similarities and differences (See table 4.39) related to dominant discourses of institutional e-learning policies and the level of alignment with Education Informatization 2.0 at four universities. Discourses of institutional e-learning policies across four universities predominately

centred on technological determinism, which is also the dominant discourse of Educational Informatization 2.0. Also, the policy-making process at the four universities exhibits the same top-down hierarchical structure. It is clear to see that collaboration among stakeholders at four universities is fragmented. Stakeholder engagement in the policy-making process and the alignment with Education Informatization 2.0 exhibited differently across four universities.

Table 4.39 Similarities and Differences

Findings	University A	University B	University C	University D
Dominant Discourses	Technology Determinist	Technology Determinist & Instrumentalism	Technology Determinist	Technology Determinist
Policy-making Process	Top-down	Top-down	Top-down	Top-down
Stakeholder Engagement in policy-making Process	Counsel with Faculty and IT specialists after the first-drafted policy, Informed students	Counsel with Faculty and IT specialists after the first-drafted policy, Informed students	Keep Faculty, IT specialists, and Students Informed	Counsel with Faculty and IT specialists for large-scale e-learning projects, Informed students
Alignment with Education Informatization 2.0	Partial Alignment	Partial Alignment	Partial Alignment	Full Alignment
Collaboration among stakeholders	Fragmented structure, inconsistent communication, frustration over the current level of collaboration	Barriers to communication, lack of understanding between Faculty and IT specialists	Inadequate communication, misaligned expectations, and a lack of robust support framework	Undefined roles for IT, misaligned expectations, inadequate communication

Source: Author's own work

The table 4.40 displays that a range of challenges, falling under financial factors such as budgeting conflicts and investment priorities, are identical across four universities. There are three cost-effectiveness concerns across four universities. Two out of three cost-effectiveness concerns, financial constraints on faculty training and the imbalance between cost-effective tools & quality of learning, are prevailing across four universities. One particular challenge, the lack of scalable infrastructure, arising

from another cost-effective concern, is only exhibited at Universities A and B.

Table 4.40 Shared Challenges and institutional Disparities from Financial factors

Challenges from Financial Factors			University Code			
			A	B	C	D
<b>Budgeting Conflicts</b>	Mismatch between Financial Investment & Institutional Needs		✓	✓	✓	✓
	Policy Changes and Financial Inflexibility		✓	✓	✓	✓
<b>Investment Priorities</b>	Financial Investment in Technologies & Pedagogical Alignment	Under-utilization of E-learning tools	✓	✓	✓	✓
		Ineffective teaching and learning outcomes	✓	✓	✓	✓
		Wasted Investments and Financial imbalance	✓	✓	✓	✓
	Limited Financial Resources for Customization & Adaptation of Tools	Limited adaptability	✓	✓	✓	✓
		Lack of integration with external tools	✓	✓	✓	✓
		Inflexible course design features	✓	✓	✓	✓
<b>Cost-Effectiveness</b>	Financial Constraints on Faculty Training	Increased reliance on external vendors	✓	✓	✓	✓
		Widening digital divide among faculty	✓	✓	✓	✓
	Ongoing Maintenance & Upgrades with Limited Funding	Difficulty in Predicting long-term Maintenance Costs	✓	✓	✓	✓
		No clear Decommissioning Strategy for Obsolete System	✓	✓	✓	✓
		Lack of Scalable Infrastructure to Support Growth and updates	✓	✓		
		Risk of over-reliance on legacy system	✓	✓	✓	✓
	The Imbalance between Cost-effective Tools & Quality of Learning	Select free tools that lack critical pedagogical and technical features	✓	✓	✓	✓
		Over-reliance on Open Source and Free Educational Content	✓	✓	✓	✓

Source: Author's own work

Synthesizing research findings, the table 4.41 shows that all four universities face common barriers from technical factors, such as technical support system, information accessibility, and technological innovation and integration, while integrating e-learning into teaching and learning.

Table 4.41 Shared Challenges from Technical Factors

Challenges from Technical Factors			University Code			
			A	B	C	D
<b>Technical Support System</b>	Sufficient IT support for basic users		✓	✓	✓	✓
	Delays in problem-solving for advanced users		✓	✓	✓	✓
	Discouragement of innovation in teaching and learning		✓	✓	✓	✓
<b>Information Accessibility</b>	Generalization of e-learning guidelines and faculty disengagement		✓	✓	✓	✓
	Lack of customized protocols for discipline-specific needs		✓	✓	✓	✓
	Gaps in online library guidelines and library online resource utilization		✓	✓	✓	✓
<b>Technological Innovation</b>	Innovation-integration paradox		✓	✓	✓	✓

<b>&amp; Integration</b>	A misaligned trajectory between technology innovation and pedagogical shifts	✓	✓	✓	✓
	Redefining the role of IT specialists	✓	✓	✓	✓

Source: Author's own work

The table 4.42 shows that most challenges related to faculty digital literacy, pedagogical shifts, and faculty professional development are prevailing across four universities. However, participants at University C exhibit different pattern, which indicate faculty's intention to get involved in policy-making process. Also, participants at University C indicate that their professional development center initiated a plan to build in-house expertise, but they worried about the sustainability of institutional support for this initiate. Compared with University C, University A, B, and D do not launch any initiatives to build in-house expertise. Another difference across universities is that University A, C, and D rely on traditional course rating metrics, which does do not capture meaningful insights of innovative teaching using e-learning technologies. Although University B has deployed some benchmarks evaluating innovative teaching, they only evaluate whether faculty integrate LMS features or e-learning tools into teaching.

Table 4.42 Shared Challenges and institutional Disparities from Pedagogical Impact

<b>Pedagogical Impact and Challenges</b>			<b>University Code</b>			
			A	B	C	D
<b>Faculty Digital Literacy</b>	A growing divide between faculty digital literacy & e-learning policies	Uneven technology adoption	✓	✓	✓	✓
		Perception of Policy vs. Practice	✓	✓	✓	✓
		Training Fatigue and Disengagement	✓	✓	✓	✓
		Shifting towards needs-based policy design			✓	
<b>Pedagogical shifts</b>	Increased workload from pedagogical shifts	Faculty burnout and disengagement	✓	✓	✓	✓
		Surface-level adoption	✓	✓	✓	✓
		Student learning compromise	✓	✓	✓	✓
	Faculty Resistance to Prescribed Active Learning Methods	Undermined professional expertise	✓	✓	✓	✓
		Surface-level implementation	✓	✓	✓	✓
		Disjointed student experience	✓	✓	✓	✓
		Superficial Metrics vs. Meaningful Insights	✓		✓	✓

<b>Challenges from Faculty Professional Development</b>	Policy Expectation vs. Faculty Workload	✓	✓	✓	✓
	Policy Expectation vs. Faculty Development Needs	✓	✓	✓	✓
	Building In-House Expertise: Investment vs. Institutional Support			✓	

Source: Author’s own work

The table 4.43 shows recurring barriers related to students’ digital literacy across four universities indicated that lack of assessment of students’ digital literacy are not isolated issues but systematic problems. For barriers to student engagement and participation, University D exhibit greater capacity to meet needs of growing student population due to the fact that their have built a sufficient number of smart classrooms.

Table 4.43 Shared Challenges and Institutional Disparities from Student Engagement

<b>Student Engagement &amp; Learning Experience</b>		<b>University Code</b>			
		A	B	C	D
<b>Students’ Digital Literacy</b>	Assumed readiness vs. Actual competence	✓	✓	✓	✓
	Blind confidence vs. Unrecognized skilled gaps	✓	✓	✓	✓
	Vague policy expectations vs. Student misconception of digital literacy	✓	✓	✓	✓
<b>Barriers to Student Engagement &amp; Participation</b>	Assessing student engagement: Metrics vs. Meaningful learning	✓	✓	✓	✓
	Variability in Faculty Professional development & uneven learning experience	✓	✓	✓	✓
	Unequal access to Smart Classrooms	✓	✓	✓	

Source: Author’s own work

The comparative analysis across the four universities reveals that the recurring challenges are not merely institutional differences but structural outcomes of how financial, human, and technical logics interact under policy pressures. Financially, budgeting conflicts and investment priorities reflect a compliance-driven funding logic that rewards visible technological expansion rather than sustainable pedagogical development. This explains why cost-effectiveness concerns—such as limited faculty training investment and the imbalance between low-cost tools and learning quality—persist across all institutions, with infrastructure scalability issues emerging

only where resources are stretched thin (Universities A and B). On the human dimension, the widespread issues of faculty digital literacy and pedagogical adaptation indicate that professional development remains procedural, though University C's initiative to build in-house expertise reflects an emerging shift toward internal capacity building, constrained by uncertain institutional support. Technically, reliance on outdated course evaluation metrics at most universities—focused on LMS usage rather than teaching innovation—demonstrates that technological adoption has outpaced meaningful integration, while only University B's partial benchmark use signals limited progress. Finally, student-related challenges, including low digital literacy and uneven engagement, are systemic rather than isolated, with only University D showing stronger adaptation through investments in smart classrooms. Collectively, these patterns underscore that the misalignment stems from systemic fragmentation—where financial compliance, limited human capacity, and uneven technical integration reinforce one another—rather than from institutional shortcomings alone.

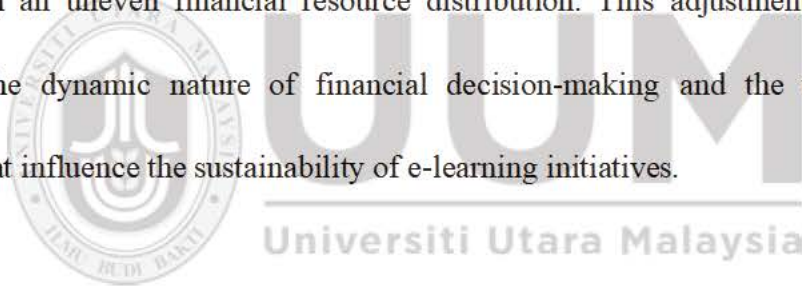
After all data have been interpreted, the author would like to express how the author mitigated interpretative bias. As a faculty who has implemented e-learning in an academic HEI, the author was acutely aware that his familiarity with digital pedagogy could shape how he interpreted participants' responses and how he framed the research instruments. The author's professional experience offered insider insight into institutional realities but also risked interpretive bias—particularly the tendency to

assume shared understanding of technical or policy terminology, or to overemphasize pedagogical concerns from a faculty-centric perspective. To mitigate this, the author adopted a reflexive and iterative design approach throughout data collection. The author simplified and localized technical terms to ensure clarity, rephrased potentially sensitive questions to respect cultural norms of hierarchy and face, and reordered items to build trust before addressing policy critique. The author also complemented focus group discussions with individual follow-ups to give participants—especially junior faculty and students—safer spaces to express views candidly. Regular memo writing after each session allowed the author to document his assumptions and revise interview protocols accordingly, ensuring that participants’ voices, rather than my own preconceptions, guided the interpretation of findings. This reflexive stance aligned with the ethos of CDA, emphasizing the need for continuous awareness of how positionality and discourse interact in shaping meaning.

#### **4.11.2 Emerging Themes Not Captured in the Conceptual Framework**

There are three emerging themes, budgeting conflicts, investment priorities, and technology innovation and integration, which are not outlined in the conceptual framework. This section will firstly analyze why does the shift move from “Initial Investments” and “Running Costs” to “Budgeting Conflicts” and “Investment Priorities”. Then it will provide critical insight on the emerging theme, “technology innovation and integration”, developed from data interpretation.

The adjustment made for replacing “Initial Investments” and “Running Costs” justifies there is a need for a more nuanced understanding of how financial resource allocation is distributed and implemented in practice within four universities studied. The original two financial factors convey a linear, predefined financial trajectory, which indicates an upfront investment, and followed with ongoing operational costs. The data, however, unveiled a more complex picture. In the context of Chinese academic HEIs, four universities are under-funded institutions. In this context, financial resource allocations are not only related to spending at various stages but they are forged by administrative priorities and constrained by competing demands, resulting in an uneven financial resource distribution. This adjustment can better snapshot the dynamic nature of financial decision-making and the underscored tensions that influence the sustainability of e-learning initiatives.



The data revealed that administrators prioritize building smart classrooms, networked learning spaces, and data-driven platforms, followed by developing premium courses, often at the expenses of other e-learning initiatives such as technology acquisition, faculty training, and technology maintenance and upgrades. This trend indicates that financial costs are not purely financial decisions but are driven by institutional goals—displaying integration of LMS and data-driven platforms, utilization of smart classrooms, and developing premium courses for provincial and national recognition to signal technological advancement. This focus, however, on high-visibility investments have critical, less invisible components under-funded. Replacing “initial

investment” with “investment priorities,” the study snapshots how administrators allocate resources to meet their immediate and urgent institutional objectives rather than long-term sustainability goals. This shift interpreting the movement from a static financial term to a dynamic factor, which explains why and how some e-learning initiatives are prioritized while others are under-valued.

In a similar vein, “running costs” indicates a consistent, continual investment in maintaining and improving e-learning initiatives. The data, however, indicated persistent budgeting conflicts that disrupt this process. Respondents at four universities indicated that technology maintenance and upgrades, and content development are less prioritized due to insufficient funding, resulting in outdated systems and free, low-quality digital resources. This dynamic nature can be better matched with “budgeting conflict,” underscoring the frustration to balance limited financial resources against competing institutional needs. The findings revealed that running costs in maintaining and improving e-learning initiatives are not considered as strategic priority but secondary consideration, with financial resources allocated sporadically and inconsistently.

The data highlights there is an inadequate understanding of financial planning for sustaining e-learning initiatives at four universities. While they prioritize building smart classrooms, networked learning spaces, and data-driven platforms, followed by developing premium courses, these universities show their inability to guarantee the

continued development and support required to optimize the potential of e-learning initiatives. Institutional e-learning policies advocate technology integration into teaching, but faculty at four universities receive generic training sessions, which are ineffective and fragmented. In addition, faculty, also work as instructional designers, rely on freely available, low quality digital learning materials due to limited financial resources for obtaining up-to-date high-quality content. “Budgeting conflicts” and “investment priorities” can precisely profile how immediate decision-making compromises the long-term sustainability of e-learning initiatives.

The emerging theme, “technology innovation and integration”, indicates a gap between the theoretical assumptions of the original framework and the practical experience of integration of e-learning at four universities. The original framework did consider the complex nature of evolving technologies but not anticipate technology innovation as a independent analytical factor. Alternatively, the original framework place innovation as an embedded outcome within broader categories such as “technical support” and “policy alignment.” The findings, however, displayed that innovation functions not as a byproduct of high-end infrastructure or administrative plan, but as a standalone axis of institutional priority — one that intersects with and is constrained by the principle tenet of Education Informatization 2.0, support framework, policy clarity, and faculty agency.

This emerging theme provide scholars and practitioners with more room to

understand the structural and cultural constraints that impede pedagogical shifts through emerging technologies. The central focus of this emerging theme displays the pattern of unsatisfied needs among advanced users. These unmet needs signal a systemic overlook, which conveys while technical support is adequate for addressing routine, low-complexity tasks, it consistently fails to accommodate faculty and students who intend to engage in innovative teaching and learning. The prevailing challenges such as delays in problem-solving for advanced users and discouragement of innovation indicate that four universities have implemented a one-size-fits-for-all approach to IT support. This approach guarantees users employing fundamental features of LMS platforms and e-learning tools, but it fails to address the more complex requirements of those users experimenting with adaptive learning tools, API integration, and analytical dashboards. The failure to differentiate between basic and advanced users indicates a lack of vision regarding how innovation is nurtured and supported by universities.

This unaddressed gap is further exacerbated by the innovation-integration paradox, which convey the growing divide between the availability of e-learning tools and their pedagogical impact. Although universities have introduced and employed advanced technologies such as smart classroom, AI-based analytical tools, and data-driven platforms, they provide faculty without strategic support and instructional guide required for practical use of technologies in teaching and learning. As a result, these tools serve as institutional ornamentation rather than pedagogical instruments.

The challenge, discouragement of innovation, in teaching and learning highlights how inadequate IT support dramatically affect faculty motivation. Faculty who intend to employ data-driven decision-making, real-time collaboration, or AI-assisted instruction are always redirected to LMS vendors who lack of understanding of pedagogical needs, or are unsupported due to internal capacity limitations. This challenge indicates that innovation is not driven by institutional support but externally contingent and incidentally encouraged.

Incorporating technology innovation and integration into the conceptual model helps shift from a structural views of support systems to a functional critique of how emerging technologies interact with faculty and pedagogical transformation. This will harness the dynamic influence of the complex nature of evolving technologies. The updated conceptual framework adapted to the context of under-resourced universities indicates that innovation is not a linear progression from policy to practice, but a complex domain shaped by the level of institutional support, the provision of e-learning strategy, and resistance from institutional inertia.

# CHAPTER FIVE

## DISCUSSION & CONCLUSION

### 5.1 Introduction

This chapter sums up the principle findings of the study and underscores their broader implications. The chapter also outlines actionable insight based on the data interpretation how institutional e-learning policies impede or support e-learning integration from an integrative perspective. The discussion is anchored in the research objectives of this study but extends further for under-funded universities. It also provide a pathway for future institutional e-learning policies direction and research.

### 5.2 Discussion related to RQs

#### 5.2.1 Institutional E-learning Policies from 2018 to 2024

At four universities, a shared pattern emerges in how institutional e-learning policies are structured. However, e-learning policies are not standalone documents yet embedded with broader institutional educational policies at four universities. Czerniewicz and Brown's (2009) study has brought the fact that institutional e-learning policies in sampled African universities are not standalone, and do not further discuss whether either standalone or integrated e-learning policies are more beneficial to our attention. In this research context, the fact that policies related to e-learning are scattered across various documents might bring challenges related to clarity, coherence, and practical execution.

The lack of a standalone e-learning policy can cause fragmented and inconsistent performance in how technology-enhanced learning is planned and delivered. Without piecing various e-learning policy components together, to define clarity on the roles of stakeholders and measure progress are constrained. An unified e-learning policy can help align e-learning technologies with pedagogical goals and institutional priorities (Oliver, 2011).

The fragmented approach also compromise the practical implementation and monitoring. There is a necessity to coordinately plan e-learning initiatives including investment in IT infrastructure, pedagogical shifts from teacher-centered to student-centered approach, training for faculty professional development, and institutional support (Bates, 2015). Gaps may occur and overlapping initiatives can waste resources. Evaluation is relied on clear benchmarks and schedule, which is difficult to develop in dispersed policy documents (Conole, 2012).

## **5.2.2 Key insights from the discourse of Institutional e-learning policies**

### **5.2.2.1 Dominant Discourse: Technological Determinism**

The findings from CDA of institutional e-learning policies at four universities exhibit a pattern, which indicates that the dominant discourse at these universities is Technology Determinism. The prevailing discourse, Technology Determinism, at four universities positions technology as autonomous and value-neutral, suggesting that technology can automatically address all the challenges. This dominant discourse

echoed the findings of Chikuni's (2017) and Chikuni et al (2021)'s study. Chikuni et al. (2021) stated that without a critical perspective on institutional e-learning policies, Technology Determinism alone provides simplistic technological plans for complex educational problems. Corroborating this research outcome, the findings from CDA of institutional e-learning policies at four universities indicated that since technocratic optimism prevails within discourses, there are many critical issues are unaddressed, and there are three categories: ideological assumptions, vague policy expectations, and unanswered questions.

Table 5.1 Ideological Assumptions across Four Universities

University Code	Ideological Assumptions (as stated in the text)
University A	Technocentrism: Technology is central to progress and improvement.- Efficiency and Management Focus: Digital tools are used to streamline administrative functions.- Economic Rationalism: Emphasis on financial prudence, cost-effectiveness, and optimized resource use.
University B	Technology as Key Driver of Change: Technology drives educational and administrative transformation.- Alignment with Strategic Goals: Technology initiatives are positioned as naturally aligned with institutional objectives.- Equity and Access: Technology is assumed to enhance inclusion.- Technology as Neutral Tool: Technology is treated as a value-free means to improvement.- Automatic Educational Improvement: Assumes that technology use leads directly to better outcomes.
University C	Technology as Primary Driver of Improvement: Improvement is linked to technological integration.- Focus on Infrastructure and Capability Building: Emphasis on building tech infrastructure and digital competencies.- Efficiency and Managerialism: Technology is used to improve operations and data-driven decision-making.
University D	Technology as a Solution: Technology is portrayed as the main remedy for educational reform.- Enhancement of Educational Practices: E-learning technologies are believed to enhance teaching and learning.- Progress and Modernization: Integration of tech is aligned with modernization goals.- Universal Benefits: Technology is assumed to benefit all stakeholders equally.
All four universities	All four universities exhibit a cross-institutional trend of adopting Technological Determinism as the dominant framework in their e-learning policies. This approach emphasizes technology as the primary driver of change, prioritizing efficiency, modernization, and strategic alignment while assuming its universal benefits. However, there is limited recognition of contextual, pedagogical, or human factors that may influence the success of technology integration.

Source: Author's own work

Ideological assumptions displayed within discourses of e-learning policies across four

universities (See table 5.1) mirror the pervasive influence of Technology Determinism. The shared beliefs place technology as the nuclear engine of Education Informatization. This dominant discourse states that technology integration will inevitably lead to enhanced learning outcomes, streamlined administration, and greater inclusion, irrespective of educational context, preparedness of stakeholder, or pedagogical shifts.

Specifically, e-learning policies of University A mirror a technocracy ideology, indicating that technology is inherently progressive. The discourse of e-learning policies centers on efficiency and managerial control, utilizing technologies to streamline administrative burden and remain cost-effectiveness. This economic rationalism take precedence in resource optimization over educational depth, consolidating a perception of education as a system to be managed rather than a human-process to be enriched.

E-learning policies of University B follows a similar pattern. The dominant discourse states that technology innovation automatically align with institutional goals, placing e-learning platforms and smart systems as neutral instruments. The policy text strengthen the myth of technology's neutrality and universal benefits but fail to delineate how these benefits will be obtained or whether they are equally attainable by all users. In practice, these ideological assumptions compromise the consistent performance in digital learning, digital competency, and engagement with e-learning

tools among students and faculty.

E-learning policies of University C reinforce its means by utilizing technology integration for infrastructure upgrades and capacity building. Instead of placing weights on pedagogical innovation and student learning outcome, the operational efficiency for data-driven platforms are given more weights. The focus on data, performance, and reliability transforms education into a field governed by metrics, marginalized human aspects such creativity and critical thinking.

E-learning policies of University D intensifies the discourses of modernization, positioning technology as the unique solution and a universal benefit to all stakeholders. The ideological assumption states that education informatization is equivalent to educational reform and that learner-centered environments can be engineered through e-learning platforms. Overlooking psychological, emotional, and social-cultural dimensions of learning, the policy risk alienating individuals for whom technology remains unfamiliar, inaccessible, or inadequately tailored to their personal context and needs.

E-learning policies at four universities mirror a pattern, indicating that there is a narrow focus on education that conflates technological advancement with improved educational outcome, with inadequately evaluating the practical needs of those expected to implement and experience these changes. To remove these constraints,

universities should critically interrogate their ideological assumptions, embracing critical discourses that place technology not as a standalone solution, but as a component in a complex, and evolving e-learning landscape (Chikuni et al, 2021).

At four universities, e-learning policies include the presence of vague policy expectations (See table 5.2), indicating an overarching reliance on technocratic optimism within discourses. Under the broader sense, these universities articulate broad, idealistic goals (improving student engagement, fostering inclusion, and facilitating holistic student development), with no strategic plan detailing how to achieve these in practical. Specifically, University A states that introduction of blended learning and flipped classrooms will enhance student engagement, but it falls short on specifying the pedagogical approaches, faculty support systems, and student readiness assessment required. This gap reveals an expectation that change will initiate while adopting alone, instead of training for instructional design and building capacity.

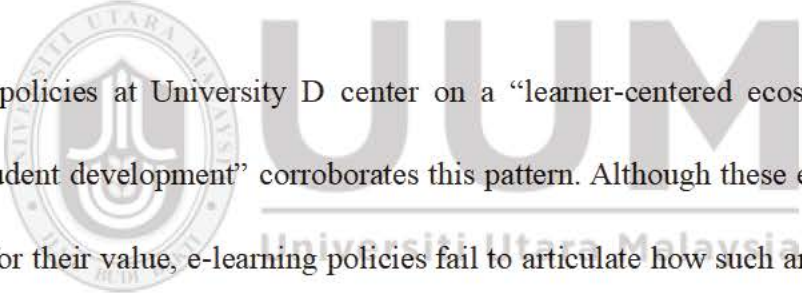
Table 5.2 Pattern of Vague Policy Expectations in E-learning Policy Texts

University Code	Pattern of Vague Policy Expectations in E-learning Policy Texts
University A	Assumes blended learning and flipped classrooms will automatically enhance engagement without stating how.- Expects faculty and students to adopt new methods without detailing support or training.- Assumes that investment in infrastructure will lead to improved learning outcomes.
University B	Expects Education Informatization and Innovation to bring transformation, but lacks clarity on expected outcomes.- Assumes Smart Digital University will inherently align with strategic goals, but omits challenges or metrics.- Expects inclusive learning via tech platforms, without defining inclusion criteria.
University C	Expects Digital Ecosystem and Smart Classrooms to enhance teaching and learning, but lacks clear objectives.- Assumes faculty and students will effectively adapt to AI and data-driven tools without addressing variance in needs or readiness.- Expects efficiency and improved outcomes from outsourcing without explaining accountability measures.
University D	Expects learner-centred ecosystem to improve education, but omits how it addresses specific learner needs.- Assumes universal benefits from digital transformation without acknowledging diversity in student and faculty circumstances.- Expects holistic development from policy without defining its scope or how it will be achieved.
All four universities	E-learning policies share common trends such as broad and ambitious expectations—like enhanced engagement, inclusion, and educational transformation—without clearly outlining how these goals will be achieved. These policies generally lack measurable objectives, defined timelines, and structured evaluation frameworks to assess their success.

Source: Author's own work

In a similar vein, e-learning policies at University B place a great value in “Education Informatization,” and the term “Smart Digital University” as vessels for transformation. These terms, however, remain vague, as there are no clear definitions, measurable goals, or criteria for success. The assumption underlies that to align with national directives of Education Informatization 2.0 and incorporate technologies will ultimately lead to the improvement of educational outcome. This, however, is not the case. In its policy, there is a lack of benchmark for evaluating the challenges-unpreparedness of faculty, inadequate high-end IT infrastructures, and diverse student learning needs, and also there is a lack of e-learning strategies to address these gaps.

E-learning policies at University C shared the same pattern. Its policies state that smart classrooms and digital ecosystems will improve learning, but no clear learning objectives, support mechanisms, or pedagogical strategies are outlined. There are no discussions over quality assurance, evaluation, and institutional accountability while outsourcing LMS service to external vendors for boosting efficiency and outcomes. This pattern mirrors a policy orientation that innovation is conflated with effectiveness, and implementation is presumed to proceed smoothly, regardless of complex e-learning landscapes.



E-learning policies at University D center on a “learner-centered ecosystem” and “holistic student development” corroborates this pattern. Although these expectations are prized for their value, e-learning policies fail to articulate how such an ecosystem can and cater to various learner needs, or how holistic development will be achieved and evaluated throughout diverse educational contexts. The linguistic description is aspirational but empty, with no detailed feasible plans.

These vague policy expectations mirror a pattern, which shows an overconfidence in the driving forces of e-learning technologies, often stated without critical perspective or strategic plans. The assumption underscores that technological advancement is adequate to achieve complex educational objectives. Without precise timelines, evaluation metrics, or full-preparedness of stakeholders, e-learning policies are likely

to produce unintended consequences. Furthermore, vague discourses can obscure responsibility, rendering universities difficult to either evaluate effectiveness or address unstructured challenges.

Table 5.3 Unanswered Questions across Four Universities

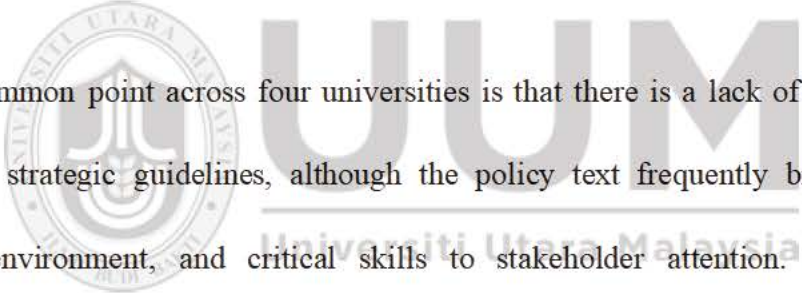
University Code	Unanswered Questions
University A	How will the university ensure that faculty and students are adequately prepared?- What steps will be taken to assess their readiness?- How will LMS platforms be selected for hybrid learning?- How will the university address the risk of technological obsolescence?- How will equitable access for all students be ensured? - Can financial control be balanced with innovation?
University B	What specific outcomes define "Education Informatization"?- How will technologies like AI, IoT, and cloud computing be implemented and evaluated?- How does the university address potential disparities in access and digital literacy?- What criteria define an "nclusive learning environment" or "critical skills"?- Are all students and faculty adequately prepared for LMS and smart classroom tools?
University C	How will accessibility issues and faculty resistance be addressed?- How will qualitative feedback be integrated into data-driven decisions?- What specifically distinguishes smart classrooms from traditional ones?- How will the policy accommodate alternative (non-tech) approaches?- What ethical considerations exist around data use?
University D	How will challenges in implementation, such as infrastructure gaps and faculty readiness, be addressed?- How will student and faculty voices be included in planning?- What are the specific learning objectives and strategies for e-learning enhancement?- How will "holistic student development" be defined and measured?- What resistance might arise around AI-driven personalization and workload shifts?
All four universities	Across all four universities, common trends include a lack of attention to faculty and student readiness for e-learning, as well as vague or unexamined digital equity issues such as access and infrastructure disparities. There is often little clarity on how technologies will be implemented or evaluated, and stakeholder involvement—particularly from students and faculty—is either minimal or entirely overlooked. Additionally, pedagogical strategies and intended learning outcomes are rarely articulated in concrete or practical terms.

Source: Author's own work

The table 5.3 of unanswered questions focused on what remain unaddressed in the policy text across four universities. This trend reveals a pattern, which indicates that there exists strategic ambiguity in the discourses of e-learning policies. This pattern is developed from the employment of broad, aspirational language that dictate the idea of Education Informatization while specific commitments, detailed strategies, and

stakeholder engagement are absent.

One point of this strategic ambiguity is the consistent focus on preparedness of faculty and students for technology-enhanced learning, albeit the lack of clarity on how their digital competency will be evaluated and supported. The policies bolster the employment of LMS platforms, AI, and smart classrooms, but they do not outlay any concrete steps for capacity building or professional development. This ambiguity creates a tension between policy expectations and institutional support, conveying a statement of compliance rather than a structured plan for development.



Another common point across four universities is that there is a lack of definitions, criteria, or strategic guidelines, although the policy text frequently bring equity, inclusive environment, and critical skills to stakeholder attention. This gives universities credit in developing commitment to fairness and inclusion, but the policy text omitted the deeper structural issues such as varying level of digital literacy among faculty and students, digital access, and inadequate institutional support. The policy text across four universities, therefore, mirror the ideals of inclusion but fail to grapple with the complex context that influence different group of learners and faculty.

Furthermore, technology is delineated in policy text of four universities as a universally beneficial solution, without the presence of potential pedagogical

challenges, ethical concerns, or resistance from faculty and students. This technocratic optimism employ technologies as an undoubted good, lacking discussions of alternative or non-tech approaches to teaching and learning. This dominate discourse marginalize pedagogical shifts and masks the complexity of evolving e-learning landscapes.

More importantly, stakeholder voices, especially students, faculty, and IT specialists, are largely silent in institutional e-learning polices. There is minimal recognition of the importance of including and empowering these groups in the development, implementation, or evaluation of e-learning strategies. Their experience of technology-enhance learning, practical needs, and potential contributions are ignored, intensifying a top-down structure of policy-making that limit the effectiveness and relevance of e-learning initiatives.

#### **5.2.2.2 Technological Determinism as Institutional Rationality?**

Rather than treating technological determinism in institutional e-learning policies as a simple ideological assumption, the findings invite a more demanding question: do universities genuinely believe that technology can solve all educational problems, or are they institutionally compelled to act as if they believe so? This distinction marks a critical theoretical shift. Under the policy environment of Education Informatization 2.0, technological optimism may function less as a cognitive misjudgment and more as a strategic, institutionally embedded mode of action.

From this perspective, technological determinism is not merely a worldview but a policy rationality shaped by governance conditions, accountability structures, and organizational risk management. The following four lines of inquiry deepen this reframing.

*Institutional Pressure and Discursive Convergence: Why Do Universities “Speak the Same Language”?*

The striking similarity across universities in policy structure, rhetoric, and ideological assumptions raises a foundational question: to what extent is discursive convergence a response to institutional pressure rather than shared conviction? Within the Education Informatization 2.0 framework, reproducing national policy language may serve as a mechanism for reducing uncertainty and safeguarding institutional legitimacy.

This convergence can be interrogated through the lens of institutional compliance. Performance evaluations, funding applications, and project assessments increasingly rely on textual alignment with national priorities. Under such conditions, technological discourse becomes a low-risk, high-visibility institutional language—easy to standardize, difficult to contest, and readily auditable.

Seen this way, technological determinism functions as a form of “safe discourse”: a vocabulary that signals reform commitment without exposing institutions to

pedagogical risk or evaluative vulnerability. What appears as ideological uniformity may therefore be better understood as discursive risk management.

#### *Technological Generalization as a By-product of Governing Rationality*

Rather than asking why universities overlook pedagogical complexity, a more incisive question is whether, under constraints of limited resources, short evaluation cycles, and diffuse responsibility, technology becomes the only reform instrument that can be governed. Teaching reform is slow, context-dependent, and resistant to quantification. By contrast, platforms, systems, and data infrastructures offer what governance systems demand: Auditability (they can be inspected), Metrics (they can be measured), and Reportability (they can be showcased as evidence of reform).

From this standpoint, the prominence of technology in policy texts reflects not pedagogical naïveté but governing rationality. Technological solutions are favored as they are manageable within existing accountability regimes. Technological generalization, therefore, is not an educational misjudgment but an organizationally rational response to how reform is evaluated and rewarded.

#### *Strategic Ambiguity: Why Do Policies Deliberately Avoid Specificity?*

The unanswered questions identified in policy texts suggest more than oversight. They may point toward strategic ambiguity as a deliberate institutional strategy. Vague goals, aspirational language, and undefined benchmarks may serve to preserve

flexibility in an uncertain technological future. Such ambiguity enables universities to: address multiple stakeholders simultaneously, maintain interpretive leeway during implementation, and avoid clear attribution of responsibility when outcomes fall short.

In this sense, visionary language substitutes for executable commitments. Technological optimism becomes functional precisely because it is underspecified. Rather than rendering policies hollow, ambiguity enhances institutional resilience by buffering against policy failure. Technological determinism thus operates as a mechanism of institutional elasticity, not rhetorical emptiness.

*Whose Rationality Is Institutionalized—and Who Is Silenced?*

Finally, the absence of students, faculty, and IT professionals in policy discourse raises a more fundamental question: whose rationalities are authorized in e-learning governance, and whose are systematically excluded? Technological discourse tends to privilege: administrative governing rationality, compliance-oriented implementation logic, and managerial notions of efficiency and control.

By contrast, teaching rationality, learning experience, and technical-pedagogical expertise struggle to enter policy texts because they are contextual, experiential, and resistant to abstraction. The dominance of technology, then, is not neutral—it reflects a discursive power structure in which certain ways of knowing are institutionalized

while others are rendered invisible. Under this reading, technological determinism emerges not as an error of belief but as the outcome of discursive authority.

### **5.2.2.3 Assumptions and Hypotheses Emerging from the Discourse**

Grounded in the above discussion, several assumptions and hypotheses can be articulated to guide further discussion and future empirical investigation:

*Assumption 1: Technological determinism in institutional e-learning policies is not primarily driven by belief in technological superiority, but by pressures for institutional legitimacy and policy compliance.*

*Assumption 2: Discursive convergence across universities reflects institutional isomorphism under Education Informatization 2.0, rather than shared pedagogical value.*

*Assumption 3: Vague policy expectations function as strategic ambiguity, enabling institutions to manage uncertainty and diffuse accountability in technology-enhanced learning initiatives.*

*Assumption 4: The dominance of technological discourse marginalizes pedagogical, experiential, and technical rationalities, limiting stakeholder participation and policy effectiveness.*

From these assumptions, the following hypotheses may be proposed for further research:

*H1: The stronger the external policy evaluation pressure, the more likely universities*

*are to adopt technologically deterministic language in e-learning policies.*

*H2: Institutions with higher accountability demands will prioritize technological initiatives that produce quantifiable outputs over pedagogical reforms.*

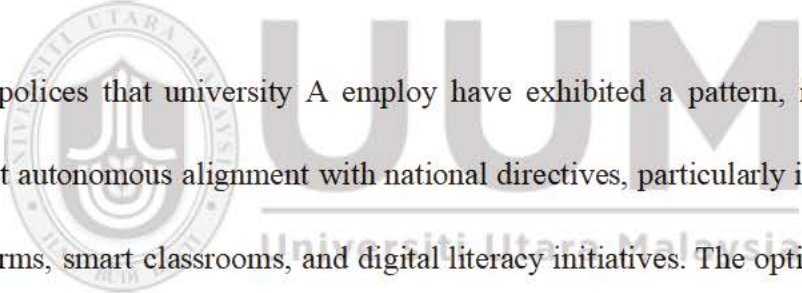
*H3: Strategic ambiguity in e-learning policies is positively associated with institutional flexibility but negatively associated with implementation clarity and stakeholder engagement.*

### **5.2.3 Alignment between Micro-level & Macro-level e-learning policy**

There is a dearth of studies on the interplay between micro-level and macro-level e-learning policy (Hu, Raman, and Shan, 2025), even though one study critically analyzes the comparison between Europe's and Flanders' e-learning policy. Although there is no complete top-down policy making (the higher policy level dictate all decisions at the lower level) between Europe and Flanders, the research provide in-depth insight, which is dynamic two-way process between macro- and micro-level e-learning policy makers (Goeman, 2006). This dynamic two-way process means that lower level policy maker (Flanders) provides feedback-such as progress reports-that help refine higher level European policies. This reciprocal exchange aids European heads monitor progress toward principle goals and facilitate cross-regional comparisons and more critical data analytic (Goeman, 2006).

However, the findings of this dissertation shows that institutional practice at four universities exposed a disconnect in the two-way feedback loop, indicating that

although MOE has conducted a widespread survey related to how double-first-class universities, China academic HEIs, and vocational HEIs incorporate e-learning into teaching and learning in 2021 and 2023 respectively, there is no qualitative study exploring practical experience and constraints that Chinese academic HEIs confronted with while embracing Education Informatization. And four universities do not submit written report to MOE of China for the refinement of Education Informatization 2.0. Unlike the reciprocal exchange embedded in European e-learning policy framework, four Chinese academic HEIs employ national directives in largely static and non-reflexive ways.



E-learning polices that university A employ have exhibited a pattern, indicating a structure yet autonomous alignment with national directives, particularly in deploying LMS platforms, smart classrooms, and digital literacy initiatives. The optional nature, however, of its digital literacy programs, the absence of student e-readiness assessment, and outsourcing of LMS indicated how university A retain institutional autonomy. In spite of these divergences, there is no mechanism reporting this institutional practice and challenges to higher-level policy makers. This means that national policy-makers can not snapshot gaps in enforcement feasibility and institutional capacity.

University B fairly adopt national directives of Education Informatization 2.0 but show a strong inclination to guaranteeing University B's autonomy. Although smart

campus development, building data-driven platforms, and student-centered learning are evident, leadership silos, weak partnership with tech companies, and no diversified funding strategies impede its full compliance with national directives. These divergences do not flow upward and there is no action to stimulate any policy refinement dialogue with national directives.

Although University C balances its autonomy with national directives, the institution also mirrors a silent feedback relationship with higher policy level. Partial alignment exhibits in its e-learning practices, especially in the voluntary nature of digital literacy training, the absence of adaptive learning models, and the decentralized CIO role. However, no dynamic two-way process is in place for these insights to influence the refinement of national policy expectations. The institution relies on internal funding instead of adopting diversified funding.

Unlike University A, B, and C, University D aligns mostly with national directives of Education Informatization 2.0, especially in its structured leadership, partnerships, and smart learning environment investments. Partial alignment exhibits in its autonomous course design, flexibility in LMS selection, and digital literacy programs. Also, there is no progress reports related to its practical experience and challenges that help refine national directives.

A essential policy contradiction emerges across four universities: although Education

Informatization 2.0 requires institutional compliance, it falls short of providing a way for Chinese academic HEIs to report their adaptations, challenges, or innovations, thereby facilitating the evolution of macro policy. This policy contradiction mirrors a one-way compliance model rather than dynamic two-way process. Due to the fact that there is no reciprocal exchange between lower and higher level policy-makers, Education Informatization 2.0 risks becoming overly too rigid and less adaptive to institutional diversity, financial constraints and regional disparities.

Another pattern developed from the findings of this dissertation also indicates that there is a need to build a feedback-driven policy framework between micro- and macro-level e-learning policies. The variation in how four universities adopt national directives of Education Informatization 2.0 highlights the autonomy displayed at the institutional level. Each university has the flexibility to shape its own strategies and advocate its priorities while remain aligned with national directives of Education Informatization 2.0. This autonomy, however, is exercised within a highly structured and regulated policy environment, and it has not been effectively employed to adapt these higher level policies to better address specific institutional needs.

In realities, these approaches taken by four universities largely mirror a top-down implementation of Education Informatization 2.0. Their focuses prioritize investments in building smart classrooms, data-driven platforms, and developing premium course over addressing more pressing local challenges such as systemic pedagogical

integration and long-term capacity building. More importantly, there is a lack of tailored solutions to bridge gaps in digital literacy among faculty and students, to strengthen IT support for faculty and students, and to allocate limited financial resources to sustaining e-learning initiatives.

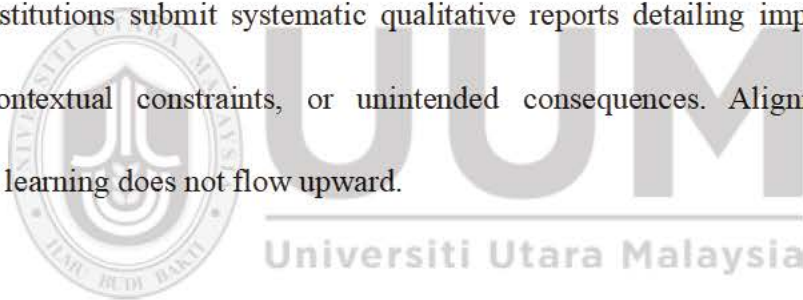
Prima facie evidence suggests that the apparent alignment between macro-level and micro-level e-learning policies reflects successful policy coordination. After all, the four universities adopt similar priorities—smart classrooms, LMS platforms, data-driven systems, and digital literacy—closely echoing Education Informatization 2.0. From this angle, discursive consistency might be read as policy effectiveness: a large, diverse higher education system speaking a shared language of modernization. The absence of extensive upward feedback could even be framed as administrative efficiency rather than institutional silence.

This interpretation is tempting—and misleading. What aligns across the four universities is not pedagogy, capacity, or practice, but language. The convergence occurs at the level of slogans, keywords, and policy form, not at the level of instructional design, faculty preparedness, or student support. Similar texts coexist with markedly different institutional conditions, uneven implementation, and unresolved local constraints. In short, alignment is discursive before it is educational.

This pattern points less to pedagogical coherence than to institutional isomorphism.

Faced with the same regulatory signals, evaluation logics, and funding expectations, universities rationally adopt the same vocabulary. Doing so reduces uncertainty, signals loyalty, and satisfies oversight mechanisms. Policy texts thus function as legitimacy devices. They reassure superiors that modernization is underway—whether or not classrooms have actually changed.

Seen in this light, micro-level “alignment” is best understood as a performance of compliance. Universities repeat the authorized language of Education Informatization 2.0 as it is safe, recognizable, and politically legible. The evidence is telling: none of the four institutions submit systematic qualitative reports detailing implementation failures, contextual constraints, or unintended consequences. Alignment flows downward; learning does not flow upward.



This one-way policy architecture matters. Without an institutionalized feedback loop, autonomy becomes cosmetic. Universities may adjust at the margins—outsourcing platforms here, making training compulsory there—but these adaptations never reshape macro-level expectations. National policy remains untouched by institutional experience, while institutions learn that visible technological investment carries more reward than slow, difficult pedagogical work. The result is predictable. Universities invest in what can be counted, displayed, and audited: platforms, systems, and infrastructure. They underinvest in what resists quick measurement: faculty development, instructional redesign, and differentiated student support. What looks

like technological confidence is, in practice, organizational risk management.

So yes—alignment exists. But it is alignment by imitation, not by shared educational reasoning. It is driven by institutional survival logic, not pedagogical consensus. And when alignment is mistaken for effectiveness, policy compliance can quietly coexist with uneven outcomes and widening digital divides. The implication is straightforward. Alignment between macro- and micro-level policy, by itself, guarantees nothing. If alignment remains discursive rather than dialogic, Education Informatization risks becoming polished, consistent, and strangely hollow. What is needed is not louder declarations of modernization, but a feedback-driven policy ecology in which institutions are allowed—and required—to speak back.

#### **5.2.4 Tensions and mismatched expectations among stakeholders**

At first glance, the tensions identified among administrators, faculty, and IT specialists could be interpreted as familiar implementation problems. From this perspective, limited stakeholder engagement might be attributed to time constraints, coordination costs, or transitional challenges associated with large-scale digital reform. Prior literature frequently frames such tensions as communication breakdowns, resource scarcity, or uneven change management during technology adoption (Freeman, 1984; Donaldson & Preston, 1995). Under this view, deeper consultation, clearer communication channels, or additional training would suffice to resolve these frictions.

This explanation is convenient—and incomplete. The evidence from the four universities suggests that these tensions are not accidental implementation failures, nor temporary disruptions in an otherwise participatory process. Rather, they are structural outcomes of how policy rationality is constructed and bounded. Faculty and IT specialists are not marginal as engagement mechanisms malfunction; they are marginal as they were never discursively positioned as legitimate policy subjects in the first place.

While the literature on stakeholder engagement rightly emphasizes inclusion and empowerment (IAP2, 2007), the findings show that all four universities remain anchored at the lowest end of this engagement spectrum. Stakeholders are informed, occasionally consulted, but rarely invited into genuine co-design. Faculty report that their input is solicited after policy drafts are largely finalized, rendering consultation symbolic rather than consequential. IT specialists, despite their central operational role, are confined to reactive support functions and excluded from strategic deliberation. Engagement exists—but it performs legitimacy rather than producing influence.

Crucially, this pattern cannot be explained solely by power imbalance or administrative oversight. Instead, it reflects a deeper ordering of rationalities within institutional policy discourse. Administrative rationality—concerned with visibility,

compliance, reputation gain, and resource acquisition—is systematically privileged. Pedagogical rationality, grounded in classroom realities and instructional adaptability, is treated as situational and negotiable. Technical-practical rationality, offered by IT specialists, is filtered through managerial priorities and reduced to service provision. The result is not dialogue, but hierarchy.

Seen through this lens, stakeholder tensions emerge as discursive exclusions, not operational misalignments. Faculty skepticism, surface-level adoption of e-learning tools, and fragmented implementation are predictable consequences of policies designed without recognizing stakeholders as epistemic contributors. These outcomes extend existing literature by demonstrating that stakeholder marginalization is not merely a failure of participation, but a function of how policy texts define whose knowledge counts.

This brings the analysis back to a central question: whose rationality is institutionalized? In the e-learning policies examined, institutional rationality is narrowly defined around governance, auditability, and technological visibility. Alternative rationalities—those rooted in teaching practice, learning experience, and technical design—are silenced not by exclusion from meetings, but by exclusion from meaning-making. Reframing stakeholder tensions in this way shifts the analytical focus. The problem is not insufficient effort to engage stakeholders; it is the persistence of a policy architecture that treats engagement as decorative and

rationality as singular. Addressing these tensions, therefore, requires more than improved consultation mechanisms. It demands a structural reorientation of policy discourse—one that recognizes faculty and IT specialists not as actors of policy, but as co-authors of educational rationality itself.

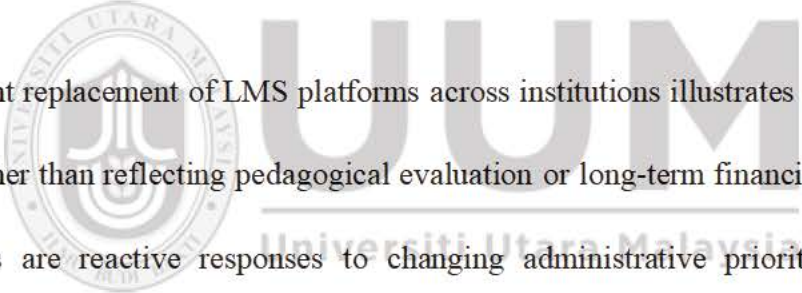
### **5.2.5 Tensions between Financial resources and Institutional needs**

At face value, the financial challenges identified across the four universities appear consistent with a familiar narrative: e-learning struggles as funding is insufficient. Prior studies and official reports have repeatedly documented limited financial resources, unstable funding streams, and rising costs associated with digital infrastructure in Chinese academic HEIs (The Information Technology Center of MOE, 2021; 2023; Ting et al., 2018; Wang et al., 2018; Zhao & Song, 2021). From this perspective, uneven implementation, outdated systems, and under-supported faculty development could be read as predictable consequences of budget scarcity.

This explanation is partially correct—and analytically incomplete. The findings of this dissertation suggest that the core issue is not simply how much money is available, but how funding decisions are made and justified. Across all four universities, budget allocations consistently favor high-visibility, reputation-enhancing technological projects—smart classrooms, premium online courses, platform upgrades—over less visible but pedagogically critical investments such as faculty training, instructional design support, and long-term system maintenance. Scarcity exists, but it is

strategically managed.

This pattern reveals an underlying funding logic: technological solutions are chosen because they are fundable, visible, and reportable. They fit neatly into existing budgeting mechanisms, procurement procedures, and performance indicators. Platforms can be purchased, infrastructure can be showcased, and expenditures can be audited. Pedagogical needs, by contrast, are diffuse, long-term, and difficult to quantify. Faculty development rarely produces immediate metrics. Instructional quality resists tidy accounting. As a result, pedagogy remains fiscally illegible.



The frequent replacement of LMS platforms across institutions illustrates this logic in action. Rather than reflecting pedagogical evaluation or long-term financial planning, these shifts are reactive responses to changing administrative priorities, vendor offerings, or short-term funding windows. While prior literature notes the instability caused by such transitions, the findings here demonstrate how they stem from fragmented financial governance rather than technical necessity. Each new system promises modernization; each disrupts continuity.

Critically, this study challenges the assumption—common in earlier research—that improved e-learning outcomes naturally follow increased funding. The evidence suggests otherwise. Even when resources are available, their impact depends on whether financial planning is coherent, stable, and pedagogically anchored. In the

cases examined, inconsistent budgeting, generic vendor-led training, and neglected maintenance undermine the educational value of technological investment. Money is spent; learning does not necessarily improve.

This reframes the issue. The problem is not a lack of commitment to e-learning, nor even a lack of investment. It is the dominance of a governing rationality that privileges what can be funded, displayed, and reported upward. Technology becomes attractive not because it transforms teaching, but because it aligns with institutional accountability regimes. Seen this way, financial decision-making operationalizes technological determinism. Technology is not merely a tool; it is a governance instrument. It structures how resources flow, how success is narrated, and how compliance is demonstrated. Pedagogical concerns—complex, contextual, and slow—are sidelined not by neglect, but by design.

The implication is clear. Sustaining e-learning initiatives requires more than increased budgets or diversified funding sources. It demands a policy framework that renders pedagogical work financially legible and institutionally valued. Without such a shift, universities will continue to invest in technologies that govern well but teach poorly—efficient on paper, fragile in practice.

### **5.2.6 Tensions between Training and Faculty needs**

At first glance, the training deficits identified across the four universities appear

familiar. Prior studies consistently argue that limited digital literacy, heavy workloads, and insufficient pedagogical support hinder faculty engagement with e-learning technologies in Chinese universities (Zhao & Song, 2021; Tsegay et al., 2022; MOE IT Center, 2021; 2023). From this angle, repetitive workshops, superficial platform use, and faculty fatigue could be dismissed as implementation gaps—unfortunate but fixable oversights in otherwise well-intentioned policy design.

This explanation is convenient but not complete. The findings of this study suggest that training gaps are not accidental omissions but predictable consequences of how institutional e-learning policies conceptualize capacity. Across the four universities, training programs are predominantly top-down, standardized, and platform-centric. They assume that once faculty are “trained” to use an LMS, pedagogical capacity will follow. Adoption is treated as evidence of competence. Usage becomes a proxy for understanding.

This assumption—adoption equals capacity—is the first structural fault line. It collapses a complex, context-sensitive learning process into a checklist exercise. As the findings demonstrate, faculty comply by logging in, uploading materials, and assigning quizzes, while deeper pedagogical transformation remains rare. Earlier studies note the absence of instructional design training in online and hybrid contexts (Liu et al., 2019; Li et al., 2017; 2019), but this research shows how such absence is normalized by policy frameworks that never fully articulate what pedagogical

competence in digital environments actually entails.

A second, less visible mechanism is strategic ambiguity. Institutional policies promote aspirational language—student-centered learning, blended innovation, digital transformation—while offering little operational clarity about expectations, workload recognition, or pedagogical standards. Training, in turn, mirrors this ambiguity. Workshops repeat generic principles, avoid discipline-specific challenges, and rarely engage with classroom realities. Faculty resistance, therefore, does not stem from technophobia but from rational disengagement with content that fails to respect their professional expertise.

A likely counterargument is that universities face scale constraints: standardized training is efficient, measurable, and administratively manageable. Yet efficiency here comes at a pedagogical cost. Evaluation metrics further reinforce this logic. As both prior literature and this study show, institutions privilege platform analytics—login frequency, content uploads, quiz completion—over evidence of learning quality or instructional coherence (Tsegay et al., 2022). What gets measured gets trained for. Teaching quality, once again, remains difficult to count.

The findings also challenge the persistent binary in existing research that categorizes faculty as either digitally competent or lagging behind. Instead, digital capacity emerges as a spectrum shaped by motivation, disciplinary context, and institutional

support. Faculty burnout, widely reported in the literature (Chen, 2017), appears less as a personal deficit and more as a policy outcome. Innovation is encouraged rhetorically but unrewarded structurally. Workloads expand; recognition does not.

Notably, the bottom-up, peer-led initiative at University C disrupts this pattern. By building in-house expertise and contextualized support, it demonstrates that meaningful capacity development is possible when training aligns with faculty realities. Its rarity in the literature, however, underscores how unusual such approaches remain within dominant policy frameworks. These findings reposition faculty training gaps as symptoms of technocratic optimism—the belief that platforms, once deployed and demonstrated, will naturally improve teaching. Training becomes a symbolic gesture, designed to legitimate policy implementation rather than to cultivate pedagogical depth. Capacity is presumed, not developed.

The implication is unambiguous. Addressing faculty disengagement does not require more workshops, more platforms, or more mandates. It requires abandoning the illusion that technological adoption produces educational capacity. Until institutional policies move from compliance-centered training to context-aware, pedagogically grounded support, faculty “resistance” will remain not a failure—but a rational response.

### 5.2.7 Tensions between Technical Support and Faculty & Students

A competing interpretation of these findings is that the observed limitations in IT support and pedagogical integration are transitional problems inherent to large-scale digital transformation. From this perspective, a one-size-fits-all LMS strategy may be viewed as an administratively rational response to scale, cost control, and system standardisation, particularly within resource-constrained universities (Liu et al., 2019; McConnell, 2017). Similarly, reliance on external LMS vendors for advanced technical features could be interpreted as an efficient division of labour, allowing institutions to prioritise teaching and research while outsourcing specialised technical expertise (Wang et al., 2018; Tsegay et al., 2022). Faculty's surface-level engagement with e-learning tools, under this view, might reflect individual variation in digital competency, time constraints, or resistance to pedagogical change rather than institutional shortcomings (Zhao & Song, 2021).

However, the findings of this study suggest that such explanations are insufficient. Rather than temporary growing pains or individual-level deficits, the patterns observed across four universities point to a structural condition produced by platform-centred e-learning policies. In these policy frameworks, platforms are positioned as self-evident solutions, while responsibility for meaningful pedagogical integration is implicitly transferred to faculty and students. The institutional role is largely confined to procuring, deploying, and maintaining systems at a baseline functional level, thereby guaranteeing minimum compliance but offering limited

scaffolding for advanced or innovative use. This displacement of responsibility explains why IT specialists' roles remain narrowly defined around troubleshooting rather than instructional partnership, and why faculty are expected to independently translate technical affordances into pedagogical value without adequate institutional support (Fu et al., 2022; Li et al., 2017).

The recurring reliance on external LMS vendors for complex functions further illustrates this dynamic. While vendor support ensures technical operability, it often lacks pedagogical sensitivity, reinforcing a separation between technological capability and educational purpose (Wang et al., 2018; Tsegay et al., 2022). As a result, advanced LMS features—such as learning analytics dashboards or adaptive learning tools—exist more as symbolic indicators of technological modernity than as embedded components of teaching practice. This contributes to the innovation–integration paradox identified in the findings, where sophisticated technologies are introduced without corresponding institutional capacity-building, leading faculty to experience e-learning as an administrative burden rather than a pedagogical resource.

The silent discourse identified in institutional policy texts further strengthens this interpretation. The absence of explicit attention to differentiated user needs, instructional design support, and the evolving role of IT specialists is not merely an oversight but reflects a discursive narrowing in which what can be quantified,

reported, and audited takes precedence over what is experienced, relational, and pedagogical. Stakeholder theory reveals how IT specialists and students are discursively marginalised in policy formulation, while Activity Theory highlights unresolved contradictions between tools, subjects, and rules—contradictions that policies implicitly acknowledge through ambitious rhetoric but fail to resolve through concrete support structures.

These findings challenge prevailing assumptions that attribute limited pedagogical use of e-learning technologies primarily to faculty resistance or inadequate digital competency. Instead, they demonstrate that disengagement is a rational response to platform-centred policies in which institutional ambition outpaces institutional support. Responsibility is shifted downward to users, while training, guidance, and collaborative structures lag behind strategic discourse. In this sense, the challenges observed in Chinese academic HEIs are neither accidental nor transitional; they are downstream effects of governance arrangements that prioritise technological deployment over pedagogical enablement.

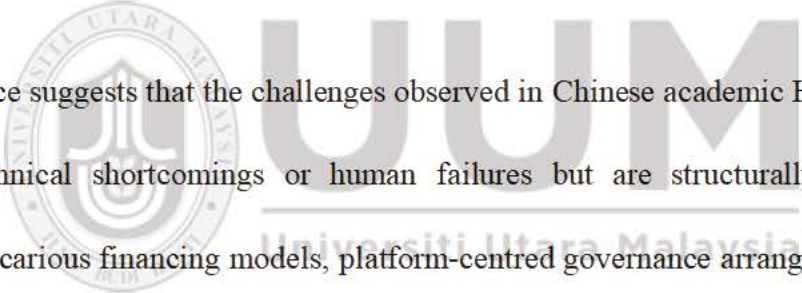
The preceding subsections in this chapter demonstrate that institutional tensions surrounding funding allocation, faculty training, and technical support are not isolated implementation problems but interconnected manifestations of deeper governance and policy configurations within Chinese academic HEIs. When viewed collectively, the eight gaps identified in this study point beyond institution-specific constraints toward

systemic dynamics that shape how e-learning is conceptualised, resourced, and governed. To contextualise these findings, this discussion situates them within post-2021 international debates on platformisation, digital sovereignty, and the changing political economy of higher education.

From this broader perspective, the gaps uncovered in the study reflect global transformations in the governance of digital education. The failure to differentiate between basic and advanced users reproduces an innovation–integration paradox in which the adoption of technological tools outpaces the development of pedagogical capacity and role-differentiated support structures (OECD, 2023). Similarly, chronic under-resourcing and episodic budgeting for platform maintenance, content development, and system upgrades mirror international patterns of short-term financing and escalating platform costs, which generate operational fragility and deepen institutional dependency on external vendors (KPMG, 2023; cloud vendor reports, 2024). While institutional and national policies frequently articulate commitments to equity and inclusion, these aspirations are often insufficiently operationalised, leaving disparities in access, digital literacy, and institutional support largely unaddressed—a concern widely documented in recent studies of digital inclusion and learning analytics ethics (Livingston, 2023; Liu, 2023).

At the governance level, the increasing platformisation of university infrastructures concentrates infrastructural and decision-making power within externally controlled

systems. This shift intensifies risks associated with vendor lock-in, data extraction, and surveillance, thereby reshaping both institutional autonomy and everyday pedagogical practice (Gourlay, 2024; Komljenovic et al., 2024). These global dynamics resonate strongly with the findings of this study, particularly in how platform-centred policies contribute to policy misalignment and a compliance-oriented institutional culture. National and institutional directives do not reliably translate into responsive classroom practice, resulting in fragmented stakeholder responsibilities and the systematic under-utilisation of available technologies (Komljenovic et al., 2024; Shaik, 2024).



The evidence suggests that the challenges observed in Chinese academic HEIs are not merely technical shortcomings or human failures but are structurally produced through precarious financing models, platform-centred governance arrangements, and surface-level policy enactment. This alignment between local findings and international trends underscores the need for autonomy-oriented governance, sustainable and anticipatory budgeting frameworks, and ethically grounded data practices that move beyond symbolic commitments toward materially supported pedagogical transformation.

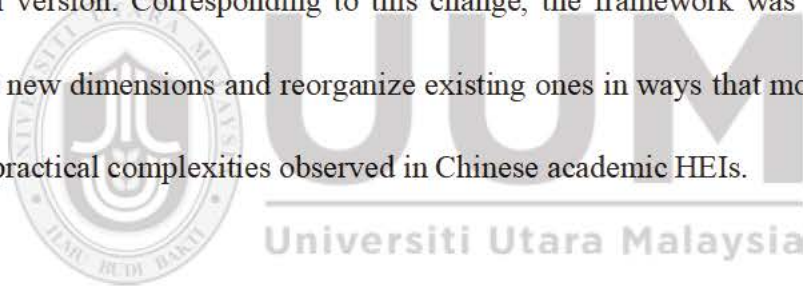
### **5.3 Research Contributions**

#### **5.3.1 Revised Conceptual Framework of Institutional E-learning Policies**

It is vital to know that the conceptual framework underpinning this study was initially

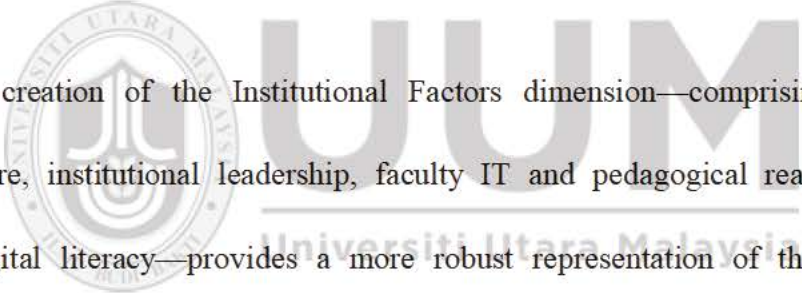
developed from a synthesis of prior studies and established e-learning models. The original framework focused on exploring institutional e-learning policies through the interrelated dimensions of human, technical, and financial factors, interplayed within national directives of Education Informatization 2.0. This original version acted as a foundational lens analyzing institutional e-learning policies from an integrative perspective.

As the empirical data and emerging themes indicated, thematic analysis of interview data, however, revealed critical contextual dynamics that were not fully captured by the original version. Corresponding to this change, the framework was reshaped to incorporate new dimensions and reorganize existing ones in ways that more precisely mirror the practical complexities observed in Chinese academic HEIs.



A key revision was the introduction of Institutional Factors as a distinct category. It is obvious to see in the original framework, factors such as faculty and student digital readiness were categorized under human factors. The qualitative data, however, indicated that these factors are not merely individual attributes but are profoundly shaped by broader institutional structures—including leadership, IT infrastructure, and institutional support. It is important to point out this reconceptualization aligns with a growing body of literature that emphasizes the critical role of institutional capacity in the success of e-learning initiatives. There are two studies, Ifinedo (2007) and Aydin and Tasci (2005), highlighting the importance of institutional commitment,

leadership, and strategic planning in enabling effective e-learning environments. It is also critical to see that Bates (2000), similarly, underscores that driving technological change in higher education necessitates coherent leadership and policy integration. UNESCO (2011), identifies institutional readiness—including scalable infrastructure, faculty development, and administrative foresight—as fundamental to translating macro-level e-learning policies into impactful educational practice. Also it is great to know that Al-Azawei et al. (2016)'s study indicating that digital readiness among students and faculty is contingent not only on personal motivation but also on the institutional conditions that catalyze or inhibit e-learning engagement.



Thus, the creation of the Institutional Factors dimension—comprising scalable infrastructure, institutional leadership, faculty IT and pedagogical readiness, and student digital literacy—provides a more robust representation of the structural enablers necessary for sustainable e-learning ecosystems. Adding this new dimension, It distinguishes the conditions that must be present at the institutional level to support individual participation and technology integration across universities.

It is also critical to make this revision, as the revised framework integrates deeper insights from Stakeholder Theory, highlighting the dynamic and often contested nature of e-learning policy processes. There is a pressing need to see the findings exhibit that stakeholder engagement in policy-making, and conflicts and cooperation among faculty, administrators, and IT personnel, play a critical role in shaping both

policy discourse and implementation. In addition, these factors were reclassified within human factors to move beyond individual-level competencies and instead foreground the social and relational dimensions of policy development. From a theoretical point, Stakeholder Theory (Freeman, 1984; Mitchell et al., 1997) offers a valuable analytical lens for understanding how divergent interests, negotiations, and collaborations among key actors influence institutional decision-making and implementation dynamics.

Moreover, the revised framework adopts a multi-layered perspective, categorizing factors across external, organizational, and individual levels. This structure emphasizes the interaction between macro-policy (Education Informatization 2.0), institutional leadership, and the lived experiences of stakeholders. By distinguishing between theoretical constructs and those grounded in empirical findings, the framework captures both the normative intentions of policy and the complex realities of its enactment.

This revised conceptual framework (See Figure 4.12), to summarize, established a more comprehensive, empirically grounded, and theoretically informed model for understanding institutional e-learning policy. It moves beyond static policy analysis to account for the dynamic, multi-level, and stakeholder-driven nature of digital transformation in higher education. Last but not the least, incorporating institutional readiness as a core factor, the newly developed framework provides a more accurate

and practical reflection of the conditions under which e-learning initiatives can be successfully implemented and sustained.

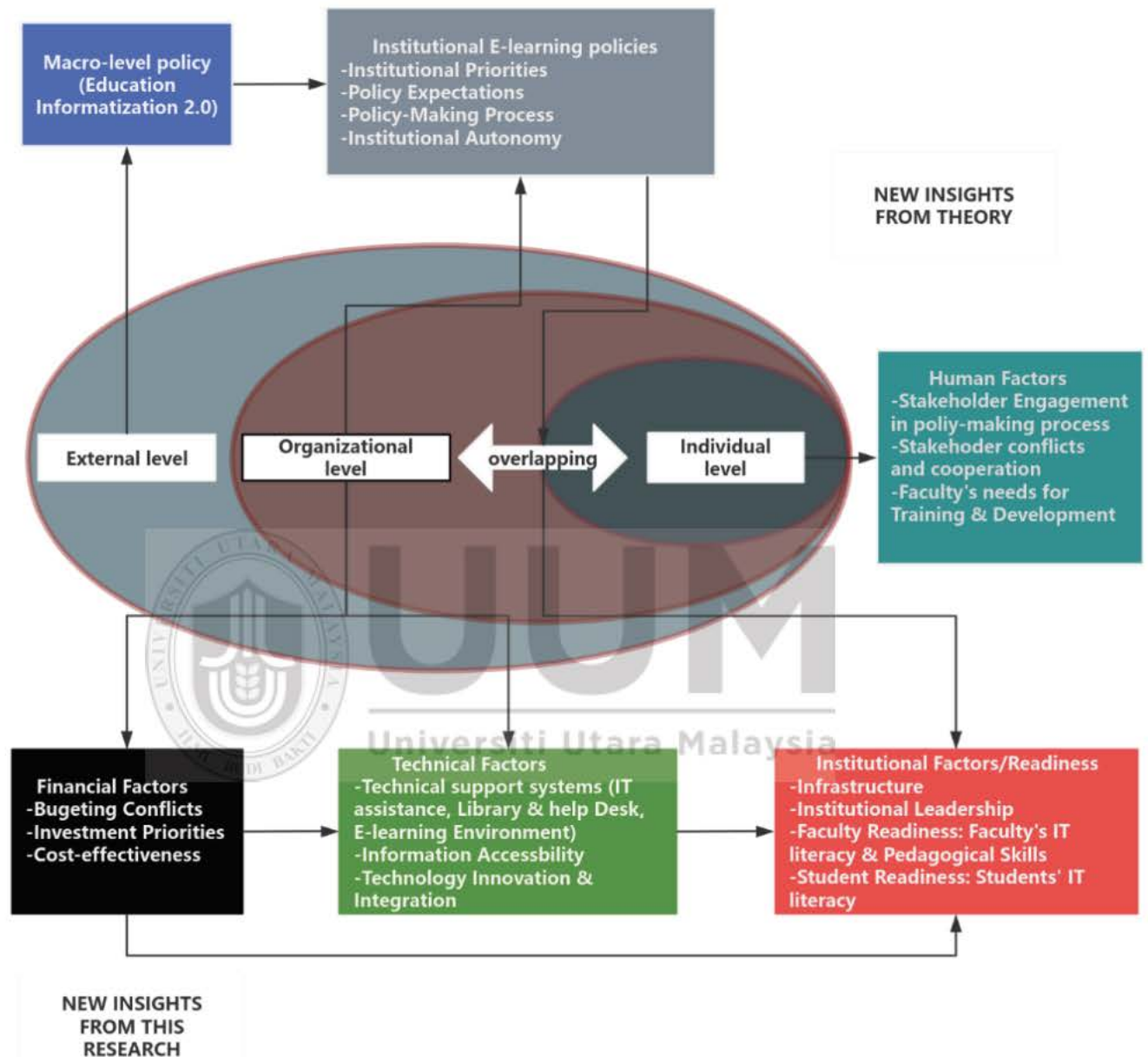


Figure 4.12 Revised Conceptual Framework of Institutional E-learning Policies  
Source: Author's own work

### 5.3.2 Theoretical Contributions

This study has developed a conceptual model used to prompt understanding of institutional e-learning policies from an integrative perspective consisting of financial,

human, technical, and institutional factors. Unlike prior theoretical models, such as SAMR, eMM, and TPACK, which primarily emphasize either pedagogical, technical, or maturity dimensions in isolation, the conceptual model developed from this study has contributed to identifying how contradictions across human, financial, technical, institutional, and policy perspective lead to tensions that hinder the technology integration at universities. This study also incorporated policy and financial perspective into a holistic e-learning model, as few extant studies have addressed policy and financial perspective while composing a multidimensional lens on technology integration (Hu & Raman, 2024).

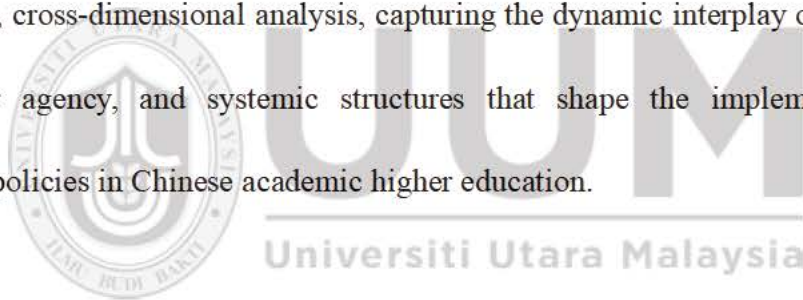
This conceptual framework prompts in-depth know-how by placing institutional e-learning policies and financial factors as central constructs that shape and constrain technology integration. This multidimensional framework detailed a more nuanced and context-conscious understanding of technology integration, providing a compelling alternative to linear or static models. The study builds a new pathway for theoretical exploration into structural and contextual contradictions emerge and persist within evolving e-learning landscape in higher education. This study extends extant theories, and build a foundation for researchers to reestablish e-learning integration as a policy-centered, cross-dimensional conceptual framework, simultaneously examining the interplay among policy, human, financial, technical, and institutional factors.

### 5.3.3 Methodological Contributions

This part displays the methodological contributions of this study, outlining innovations in research design, data collection, analysis procedures, and the methodology positioned within the qualitative research paradigm. This research employs a generic qualitative research, adding value to the field by exhibiting its suitability for exploring institutional e-learning policies in convoluted, multi-stakeholder context, which is often neglected in traditional case study or ethnographic designs. This study adopts a layered data collecting strategy by integrating semi-structured interviews, group interviews, with document analysis and stakeholder triangulation. This methodology prompted a nuanced snapshot of institutional narratives and implicit contradictions in institutional e-learning policies and practice. Coupling thematic analysis with critical policy discourse analysis, this dissertation develops a hybrid analytical approach that unravels not only how critical discourse analysis of e-learning policies broadly and institutionally informs ideological assumptions but also what participants report. The methodological contributions of this dissertation build a model that is able to replicate for scholars studying e-learning policies at universities.

This study also extends the analytical potential of CDA by moving beyond identifying ideological assumptions and silences in policy texts to examining how these discursive constructions manifest in practical e-learning implementation across Chinese academic HEIs. By triangulating CDA with Stakeholder Theory, the research

is able to link discursive gaps to the distribution of institutional power, highlighting whose interests are prioritized or marginalized in policy enactment. Similarly, Stakeholder Theory is refined through its integration with CDA and Activity Theory: it not only identifies and classifies stakeholders but also maps how their needs and interests interact within institutional systems, revealing tensions and exclusions that are otherwise invisible in policy documents alone. Activity Theory is enhanced by incorporating CDA and Stakeholder insights to trace how systemic contradictions between policy intentions, financial incentives, human capacity, and technical support play out in real-world practice. Collectively, this multi-theoretical framework allows for a richer, cross-dimensional analysis, capturing the dynamic interplay of discourse, stakeholder agency, and systemic structures that shape the implementation of e-learning policies in Chinese academic higher education.



#### **5.4 Practical Implications**

This dissertation offers practical implications for how China academic HEIs design, implement, and sustain e-learning reforms. At a basic level, the message is simple: universities do not suffer from a lack of policy, platforms, or ambition. They suffer from imitation without adaptation and compliance without consequence. Moving forward requires institutions to stop mistaking visibility for effectiveness and to build e-learning systems that work in real classrooms, not just in policy reports (Lewin, 1947; DiMaggio & Powell, 1983).

*Unfreeze: Interrupting the Habit of Imitation*

The first task is to unsettle comfortable routines. Universities should deliberately disrupt compliance-driven policy practices that prioritize mirroring peer institutions, gaining recognition for financial grants, or signaling alignment with Education Informatization 2.0. Internal audits should ask an unfashionable but necessary question: Which e-learning policies exist because they improve teaching, and which exist because everyone else has them? In many cases, platforms, tools, and standards have been copied wholesale, not because they fit disciplinary teaching or student needs, but because imitation confers safety and legitimacy (DiMaggio & Powell, 1983).

Faculty, IT specialists, and students should be formally invited—not symbolically consulted—to identify which systems feel performative rather than useful. Institutions should temporarily loosen their fixation on external indicators such as smart classroom counts, branded platforms, or “premium course” labels. These metrics look impressive in annual reports but often say little about learning. Creating distance from such symbols allows universities to expose a familiar contradiction: policies that satisfy external audiences while frustrating those who must actually teach and learn with them. This moment of discomfort is not a failure; it is the necessary starting point of change (Lewin, 1947).

*Change: Designing for Teaching, Not for Display*

Once imitation is disrupted, universities should act with intention. Instead of defaulting to nationally promoted tools or peer models, institutions should differentiate their e-learning strategies based on disciplines, student access conditions, and teaching practices. Uniform solutions scale well administratively, but they scale poorly pedagogically. Strategic differentiation is not defiance; it is responsible governance.

E-learning policies should be rewritten in plain operational language. Faculty and students need clarity, not slogans. Policies should specify how platforms support course design, assessment, feedback, and student engagement. Separate, clearly tiered digital competency frameworks should be developed for students and faculty, paired with practical guidance on platform use, academic databases, and discipline-specific tools. If a policy cannot be translated into a Monday-morning teaching task, it is not yet finished.

To break compliance-only behavior, universities must change what they reward. Faculty workloads, promotion criteria, and compensation policies should explicitly recognize pedagogically meaningful uses of technology, not mere platform adoption. Participation policies should define quality, not just activity. IT specialists, meanwhile, should be formally repositioned—from reactive troubleshooters to instructional partners involved in course design, learning analytics, and pedagogical consultation.

Incentives should reward problem-solving and contextual innovation, not faithful reproduction of external templates. Change happens when institutions stop applauding appearances and start rewarding outcomes (Lewin, 1947).

*Refreeze: Making Good Practice Hard to Undo*

Reform fails when it remains optional. To make change stick, universities must lock revised practices into everyday governance. Updated e-learning policies should be embedded in teaching evaluations, promotion systems, departmental reviews, and budget planning. Digital competency development should become a routine expectation across faculty and IT career pathways, not a one-off training exercise.

Regular policy review cycles should be established and grounded in classroom evidence rather than platform analytics alone. Instead of asking how many tools are used, institutions should ask whether teaching is clearer, feedback faster, and access fairer. Internal benchmarks should value instructional quality, equity, and adaptability—areas often ignored because they resist tidy measurement. These mechanisms protect institutions from drifting back into the comfort of imitation when external pressure rises again (DiMaggio & Powell, 1983).

*Translating National Ambition into Local Capability*

At a system level, universities should formalize how national directives are interpreted locally. Dedicated policy translation teams or pilot-based implementation

units can test initiatives before institution-wide rollout. This slows implementation slightly—but saves institutions from expensive, disruptive reversals later. Investment strategies should balance infrastructure with long-term pedagogical capacity. Hardware ages quickly; teaching practices do not improve by accident.

Professional development must also grow up. Faculty training should be continuous, discipline-specific, and tied directly to instructional design. IT specialists should be re-skilled and institutionally recognized as pedagogical collaborators who bridge technical possibility and classroom reality. These roles and pathways must be written into policy, not left to individual enthusiasm. Stability, not heroism, sustains reform (Lewin, 1947).



*Consolidated Institutional Actions*

The practical implications of this study converge on three institutional actions. First, universities should adopt a contextualized and differentiated approach to e-learning policy development rather than relying on imitation for legitimacy. Second, institutions should actively manage the tension between policy compliance and policy responsiveness through participatory governance and feedback loops, reducing the silent drift toward symbolic conformity (DiMaggio & Powell, 1983). Third, universities should institutionalize an integrated reform strategy that addresses financial, technical, human, and organizational dimensions together—so that legitimacy-seeking behavior no longer crowds out effective and equitable teaching

practice.

To put bluntly: universities already know how to look modern. The harder task—and the more valuable one—is learning how to teach well in a digital age, even when no recognition rewards it.

### **5.5 Limitations & Future Recommendations**

This study has clear limitations, and they are worth stating plainly. It examines institutional e-learning policies in four random purposefully selected Chinese academic HEIs. The sample is small by design. Depth was chosen over breadth. The findings are therefore analytically, not statistically, generalisable.

Yet small samples do not preclude pattern recognition. Across all four universities, the same issues recur: limited stakeholder participation in policy formulation, vague or absent provisions for emerging pedagogical challenges, and persistent tension between policy ambition and institutional capacity. These similarities are difficult to dismiss as coincidence. They point to systemic tendencies that likely extend beyond the cases studied. At the same time, the institutions differ in meaningful ways—policy responsiveness, support structures, and readiness vary. These differences align with funding models, institutional missions, and regional contexts deliberately built into the research design. In short, e-learning policy enactment is neither uniform nor random; it is structured, but uneven.

For this reason, the findings should not be read as universal claims about all Chinese HEIs. They should be read as conceptually transferable insights for institutions operating under similar governance pressures, evaluation regimes, and modernization narratives. Future research should widen the sample and diversify institutional types to test how these structural pressures interact with local conditions and institutional strategy.

A second limitation lies in analytical scope. While the study integrates Critical Discourse Analysis, Stakeholder Theory, and Activity Theory to examine institutional dynamics in depth, it does not systematically test broader external drivers. Beyond Education Informatization 2.0, factors such as variation in evaluation intensity, regional policy enforcement, and exposure to rankings remain under-explored. These omissions matter, because policy does not travel alone—it travels with metrics.

This gap opens several testable directions for future research. First, researchers should examine whether stronger external evaluation pressure increases universities' reliance on technologically deterministic language in e-learning policies (H1). Second, future studies should test whether institutions facing higher accountability demands systematically prioritize technological initiatives with quantifiable outputs over slower, less measurable pedagogical reform (H2). Third, research should investigate whether strategic ambiguity in e-learning policy texts enhances institutional flexibility

while simultaneously reducing implementation clarity and stakeholder engagement (H3). These hypotheses move the conversation from description to explanation—and from intention to incentive.

Methodologically, future work should pair qualitative policy analysis with quantitative indicators of practice: faculty participation rates, training uptake, platform usage patterns, and student engagement data. Mixed-methods designs would allow researchers to track where policy language stops and classroom reality begins. Longitudinal studies are especially needed. Policy effects unfold over years, not reporting cycles. Without time, reform always looks better on paper.

Seen from a global perspective, these limitations mirror international debates on platformisation, audit culture, and policy imitation in higher education. Universities everywhere face the same temptation: adopt what is visible, measurable, and safe. The task for future research is not simply to ask whether e-learning policies succeed, but to ask under what conditions they stop being performances and start becoming practices.

## **5.6 Conclusions**

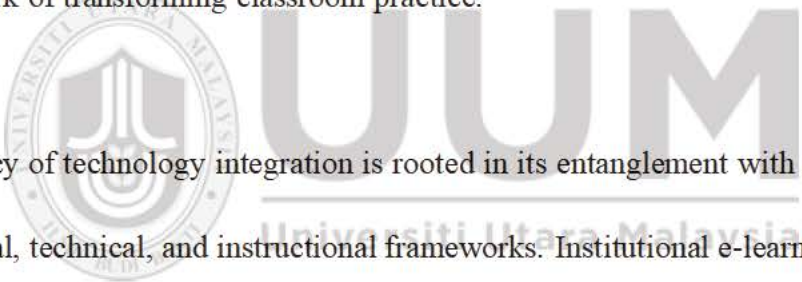
This dissertation unravels a nuanced and multi-dimensional system in which policy expectations for e-learning constantly outpace their pragmatic outcomes. Institutional e-learning policies function simultaneously as strategic declarations and operational

frameworks, shaping how e-learning technologies enter teaching and learning. In practice, however, their enactment reflects a transitional and fragmented state. Technology adoption is uneven, priorities compete rather than align, innovation is rhetorically encouraged but structurally constrained, digital divides widen, and coordination across pedagogical, technical, and administrative domains remains limited. What emerges is not policy failure, but policy strain: a governance architecture still struggling to accommodate the real complexity of educational technology integration.

From a theoretical standpoint, this study extends existing understandings of policy enactment by advancing an integrative, systems-oriented perspective on technology integration. By organizing critical success factors across financial, technical, human, and pedagogical dimensions—and by treating faculty development and student learning experience as evaluative anchors—this research demonstrates why e-learning policies cannot be reduced to formal documents or compliance instruments. They operate instead as dynamic mechanisms embedded within broader socio-technical systems. Their effectiveness depends not merely on funding levels or infrastructure provision, but on how stakeholders interact, how pedagogical knowledge is mobilized, how technical support is configured, how leadership priorities are translated, and how policy meaning shifts across institutional layers.

In this sense, institutional e-learning policies are not neutral guides; they are

instruments of organizational change. They shape roles, redistribute responsibilities, and signal what kinds of work are valued. The findings indicate, however, that this change function remains underdeveloped in Chinese academic HEIs. Policies overwhelmingly prioritize infrastructural expansion, platform deployment, and the production of premium courses, while giving comparatively little attention to pedagogical integration, sustained faculty development, instructional design support, system maintenance, and content renewal. This imbalance mirrors a familiar global pattern in education reform: instrumental rationality—what can be counted, purchased, and reported—consistently eclipses substantive rationality, which concerns the slower, messier work of transforming classroom practice.



The intricacy of technology integration is rooted in its entanglement with overlapping policy, fiscal, technical, and instructional frameworks. Institutional e-learning policies with Chinese academic HEIs are informed by overarching national directives of Education Informatization 2.0, yet must also respond to local constraints, institutional missions, and disciplinary realities. The result is a multi-layered policy architecture that demands constant negotiation between standardization and contextual adaptation. The findings show that while policy language projects reform and innovation, entrenched instructional routines and administrative logics remain largely intact. This gap between reformist discourse and everyday practice is not incidental; it is structurally produced. It signals the limits of one-directional policy design and underscores the need for flexible, feedback-driven policy frameworks capable of

learning from implementation rather than merely monitoring it.

To conclude, institutional e-learning policies of Chinese academic HEIs act as both catalyze and inhibitor to technology integration in teaching and learning. The challenges stem not from vision, but from the failure to translate that vision into coherent, learner-centered, and pedagogically driven actions. It is obvious to see that this dissertation contributes theoretically by demonstrating how discursive narrowing—policies that privilege technological visibility over pedagogical substance—can unintentionally reproduce inequality, inefficiency, and disengagement. By advancing an integrative framework, the study exposes the interdependence of financial planning, technical infrastructure, human capacity, and institutional governance, and foregrounds the decisive role of stakeholders in mediating policy effects. Ultimately, the findings argue for responsive, adaptive e-learning policies that close the persistent gap between intention and practice, enabling technological development to serve education rather than merely symbolize it.

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## **Appendix A**

### **E-learning policy at University A**

#### **Extract 1-University's Mission and Goals:**

-Fully embraces a forward-looking development philosophy, accelerating its internal growth and commitment to high-quality advancement. It is dedicated to building a distinctive, nationally leading, and high-calibre teacher education institution, contributing substantially to educational excellence and local economic and social progress.

University A (2024: Online)

#### **Extract 2-2021-2025 E-learning Plan:**

-Our university is committed to implementing the Education Informatization 2.0 Action Plan to create a technologically advanced, secure, and stable campus network platform that supports its e-learning initiatives. Efforts are underway to expand campus network bandwidth, enhance the coverage and density of wireless networks, and build a high-speed, multi-authentication campus network system. The "Today on Campus" application is being optimized to serve as a one-stop online service platform, streamlining administrative processes and reducing the need for in-person visits, thereby improving convenience for faculty and students. Multimedia teaching resource library is also being established to maximize the audiovisual capabilities of multimedia classrooms and to foster an interconnected and collaborative teaching environment.

-To further enhance the e-learning infrastructure, the university will strengthen the design and governance of its information systems and completing the construction of a big data center. This will enable cross-departmental management and data sharing, improving user experience and administrative efficiency. Additionally, the university is fortifying its website clusters and online information security platforms to ensure a safe, controllable, and stable campus network. These efforts are integral to building a robust e-learning environment that supports innovative teaching and learning experiences.

University A (2021: Online)

#### **Extract 3-Course Delivery Policy and Procedures:**

-The initiative promoting "Internet + Higher Education" and accelerating the development of online course platforms, while also emphasizing small-class teaching, blended learning approaches, and flipped classrooms to enhance the learning experience.

University A (2024: Online)

#### **Extract 4-Certification Policy and Guidelines:**

-Each online general education elective course is assigned a value of one credit, which contributes to the fulfillment of the general education elective requirements. To be eligible for credit, students must attend the course, complete all required assessments, and achieve a minimum score of 60. The awarding of credit is governed by university policy, and no exemptions or retakes will be granted for these courses.

Furthermore, incomplete courses will not affect students' academic standing and will not be reflected on their academic transcripts.

**Extract 5-Access to Online Library Database:**

-The digital resources collected by the library are restricted to use within the university's campus network (IP address range) and are available for free access by faculty, staff, and students for teaching and research purposes. Users are allowed to search, browse, download, or print these digital resources at normal speeds within the campus network.

University A (2024: Online)

**Extract 6-Strategic management of e-learning projects:**

- The policy mandates a coordinated approach to digital initiatives, including campus network infrastructure, information management systems, databases, security, and teaching resources.

University A (2024: Online)

**Extract 7-Pedagogical Approaches Guidelines:**

- The pedagogical approaches outlined focus on fostering student abilities through a mix of traditional and modern teaching methods. These methods include lectures, practical sessions, and the use of project-oriented learning, problem-solving-oriented learning, and case studies, which caters to various learners' needs. The curriculum is designed to adapt to various learning styles and preferences, allowing for a flexible learning environment that can incorporate online resources and technologies.

- The education program should adopt LMS to enhance teaching practices and student learning experiences.

University A (2024: Online)

**Extract 8-Online Instruction Policy**

-Each department head should be fully aware of the online teaching activities within their unit and implement a weekly reporting system to maintain order. Any instructor who fails to comply with these guidelines will face disciplinary action, and violations will be considered in end-of-year performance assessments.

University A (2020: Online)

**Extract 9-Technical Support and Consultation Policy:**

-The IT Help Desk offers support and guidance on university portal and apps, including system usage and troubleshooting assistance.

-Any technical issues or support are provided by LMS Companies such as Treenity, Superstar, and Rain Classroom, and U-campus.

University A (2024: Online)

**Extract 10-Data Security and Privacy Policies:**

-To safeguard its digital assets and protect the privacy of all stakeholders, comprehensive data security and privacy policies are established for mitigating digital risks and ensuring the protection of university data and infrastructure. All members of the university community are expected to adhere to these policies, contributing to the ongoing integrity and security of the institution's digital environment.

University A (2024: Online)

**Extract 11-Financial Decision-Making for Government and Non-Government Funded e-learning Projects:**

-For government procurement, the projects must align with the government procurement catalog and threshold standards.

-Non-government procurement projects also undergo rigorous budget approvals and must follow approval procedures before procurement begins. Projects with budgets exceeding certain thresholds require approval from relevant university authorities or collective decision-making.

-For non-government projects below 20,000 yuan, the project entity can proceed with procurement independently, while for projects above 20,000 yuan, approvals from university leadership are required before any procurement can begin.

University A (2024: Online)



## **Appendix B**

### **E-learning policy at University B**

#### **Extract 1-University's Mission and Goals:**

-The mission aims to build a high-level, application-oriented university with a prominent regional presence, nationwide influence, and distinctive characteristics, embracing Education Informatization, and innovation.

University B (2024: Online)

#### **Extract 2-E-learning Plan (2021-2025): Accelerating the Pace of Informatization and Building a Smart, Digital University**

-The university is committed to intensifying its efforts in informatization, with the goal of enhancing its digital capabilities. This includes building secure, stable, sustainable, and advanced technological infrastructure and digital resources for teaching and research. By leveraging advanced technologies like the Internet of Things (IoT), cloud computing, and artificial intelligence (AI), the university will implement a "Six-in-One" initiative to develop a scientific, efficient, intelligent, and secure information platform, thereby creating a "Smart Digital University."

-"Basic One Platform" Construction Project: Strengthening the university's informatization infrastructure. This involves a comprehensive upgrade of the campus network, improving wireless network coverage, and enhancing service quality. The construction of a data center as the core infrastructure platform will support the university's informatization needs. Efforts will also be made to strengthen information security to ensure the sustainable development of the university's digital systems.

-"One Website Group" Construction Project: Enhancing the university's website system. This includes the continued development of the university's website network and strengthening both university-wide and departmental website construction. The management of new media platforms such as Weibo and WeChat will also be reinforced.

-"One Data Repository" Construction Project: Advancing the development of a campus-wide data platform. This will involve creating a foundational database for the university, standardizing data processes, and improving data management and governance. The project will also promote the development of digital teaching resources, including the digital library and digital archives, expanding learning opportunities for faculty and students and improving the efficiency and quality of archival use.

-"One Network ID" Project: Advancing the development of information application and support systems. A unified identity authentication system and a centralized campus information portal will be built to provide a one-stop service for students and faculty. The integration of information systems will be accelerated, ensuring that key university operations can be carried out online or through mobile devices.

-"One Campus Card" Project: Improving the campus card system. The second phase of the campus card system will be implemented, enhancing its functionality and expanding its use in campus management. This will allow the campus card to play a more significant role in both university operations and daily campus life.

- "One Form for Services" Project: Advancing the online service system. Based on the university's core database, public information systems, and business information systems, an online form submission system will be developed. This system will standardize the collection, review, and updating of faculty and student data. By integrating with other important university business systems, a centralized "one-stop" online service portal will be created, providing a more efficient and user-friendly experience for all stakeholders.

University B (2021: Online)

**Extract 3-Policy for Designing and Developing Hybrid Courses:**

- Faculty should take a leading role in integrating pedagogical use of IT and online resources to enhance the learning experience. This includes the use of "smart classrooms" and the effective incorporation of online educational materials into their teaching practices.

University B (2024: Online)

**Extract 4-Online Courses Credit Policy:**

- Students will earn 1 credit for each online course completed on LMS such as Trinitree and Superstar, provided they achieve a final grade of 60 or higher.

- Grades will be determined based on assessments within the online learning platform, including course progress, chapter tests, and final exams.

- For courses on Superstar, the grading breakdown is as follows:

Video participation: 30%

Chapter tests: 30%

Final exams: 40%

- Only students who meet the minimum grade requirement of 60 will be awarded credit for the course.

University B (2024: Online)

**Extract 5-Student Digital Literacy Training Policy:**

- The Digital Competence in Artificial Intelligence program consists of a total of 32 hours, divided into three parts: Fundamental AI Knowledge (8 hours), Frontier AI Technologies and Applications (8 hours), and one-on-one workshops (16 hours). All students enrolled from the year of 2024 must participate in live online sessions.

University B (2024: Online)

**Extract 6-Course Evaluation Policy for Faculty:**

- Faculty should make effective use of available teaching resources, such as textbooks, digital tools, and multimedia materials. The integration of Learning Management System (LMS) will also be assessed, particularly how LMS support the course objectives and improve student learning outcomes.

University B (2024: Online)

**Extract 7-Technical Support and Consultation Policy:**

- The IT Help Desk offers support and guidance on university portal and university apps, including system usage and troubleshooting assistance.

- Any technical issues or support are provided by Outsourcing LMS Companies such as Treenity, Superstar, and Rain Classroom.

University B (2024: Online)

**Extract 8-Smart Campus Platform Guideline:**

-Smart Campus Platform, which provides streamlined, secure access to campus resources. Key functions include unified identity authentication, a comprehensive information portal, an online service center, a mobile campus app, and a data management center.

University B (2024: Online)

**Extract 9-Data Security and Privacy Policies:**

Information center should test the system, run trial operations, and manage security regularly. Vendors need to carry out security monitoring, including vulnerability scanning and penetration testing, to ensure the system is free of security risks. All system integration plans must go through an initial review and be approved to ensure secure data transmission and maintain confidentiality.

University B (2024: Online)

**Extract 10-E-Learning Budget Procurement Policy:**

-To establish a structured and competitive procurement process for e-learning facilities, tools, and resources in the electrical and electronic experimental teaching area, ensuring quality, cost-effectiveness, and adherence to ethical standards.

-Procurement Process:

- a. Platform Utilization: Utilize the Procurement Electronic Trading Platform for all e-learning facility procurement activities to ensure transparency and fairness.
- b. Bidding Process: Invite qualified suppliers to participate in a transparent bidding process, focusing on acquiring high-quality technology solutions.
- c. Eligibility Criteria: Specify rigorous eligibility criteria for potential suppliers, prioritizing reputable, financially stable companies with strong performance records.
- d. Exclusion Policy: Exclude joint bids, subcontracting, and imported products to ensure all solutions are provided by capable domestic suppliers.
- e. Selection Process: Implement a competitive selection process that deters suppliers with prior records of misconduct, reinforcing ethical and transparent business practices.

-Procurement Requirements:

- a. Technology Solutions: Seek advanced e-learning tools including interactive teaching displays, skill training assessment devices, and advanced programmable controller training systems.
- b. Learning Environment: Create a dynamic, interactive learning environment that supports practical electrical and electronic education.
- c. Accountability: Ensure a high level of accountability from domestic suppliers capable of fulfilling complex educational technology contracts.

-Policy Implementation:

- a. Policy Enforcement: Enforce the policy across all relevant departments and ensure compliance with the specified steps and processes.
- b. Ongoing Evaluation: Continuously evaluate the procurement process to identify areas for improvement and ensure the policy remains effective and up-to-date.

-Schedule regular reviews of the policy to adapt to new technological advancements and changes in the educational landscape, ensuring the university's e-learning facilities remain at the forefront of educational technology.

University B (2024: Online)



## **Appendix C**

### **E-learning policy at University C**

#### **Extract 1-University's Mission and Goals:**

-The university is dedicated to becoming a top-tier private application-oriented university in its province. Its development strategy focuses on strengthening a modern university system, enhancing internal quality, and expanding international exchange.

University C (2024: Online)

#### **Extract 2-E-learning Plan (2021-2025): Advancing E-Learning Through Smart Campus Initiatives**

-The university C is actively integrating cutting-edge technology into its educational framework to enhance e-learning. Through its partnership with Huawei, the university is building a smart campus that emphasizes the construction of smart classrooms, digital teaching platforms, and data-sharing systems. The development of a university-wide smart education platform will enable seamless integration between in-person and online learning, creating a versatile environment for innovative teaching practices. By leveraging resources such as smart classrooms and content creation facilities, the platform will support modern teaching methods and promote reforms in instructional approaches.

-Building a Digital Ecosystem to Support E-Learning: Aims to upgrade its technological infrastructure, such as full Wi-Fi 6 coverage and increased network bandwidth. Advanced network solutions, including IPv6 and SDN technologies, will establish a robust, ubiquitous campus network. Guided by a focus on mobility and integration. Developing a comprehensive digital ecosystem powered by big data, cloud computing, and mobile technologies. This ecosystem aims to support centralized data management and streamlined "One-Stop Services", and to optimize processes and improve user experiences. By aligning these initiatives with its e-learning goals, the university aims to empower classroom teaching and learning.

University C (2021: Online)

#### **Extract 3-Online Course Completion Certificates Policy:**

-Students who successfully complete select high-quality provincial and university-level online courses are eligible to receive an Online Course Completion Certificate. These certificates serve as official recognition of students' completion of the program and validate their corresponding learning achievements.

University C (2024: Online)

#### **Extract 4-Data-driven decision-making policy:**

-All departments are recommended to collect and analyze data related to academic performance, student satisfaction, and program effectiveness. This includes evaluating the effectiveness of hybrid and e-learning pedagogy.

University C (2024: Online)

#### **Extract 5-Data Security and Privacy Policy:**

-In accordance with the principle of "whoever uses it, is responsible for it," responsibility for data management is clearly defined. Data sharing should be

promoted to reduce redundant information collection and avoid the creation of "information silos.

University C (2024: Online)

**Extract 6-Course Development and Design Policy:**

-Online and hybrid courses are encouraged to be designed with a student-centered approach, integrating AI tools, LMS, smart classrooms, and other essential resources to facilitate effective and engaging hybrid learning experiences.

-Financial support will be provided based on the type of course, actual needs, and progress in development. The funding will be allocated in stages to support different phases of course development.

University C (2024: Online)

**Extract 7-Software Services Outsourcing Policy:**

-Six steps for app outsourcing service: evaluating and selecting vendors, signing contracts, monitoring project progress, and verifying the final outcomes.

-Any technical issues or support are provided by LMS Companies such as Treenity, Superstar, and Rain Classroom, and iFlytek.

University C (2024: Online)

**Extract 8-Information Technology Campus Development Policy:**

- The system consists of multi-dimensional query options for effective budget project management, allowing searches based on relevant criteria, such as department, funding category, and financial oversight group. Project teams ought to be structured with a designated project leader, who will have the authority to add, edit, or remove team members, thereby ensuring flexible and efficient

University C (2024: Online)

**Extract 9-E-Learning Budget Procurement Policy:**

-The approval workflow for procurement includes oversight from the project lead, departmental head, and financial supervisors, concluding with sign-off by a university administrator. Once approvals are completed, the university selects the appropriate procurement method (e.g., centralized procurement, competitive selection, or bidding). Contract details are then input, and the system generates a contract that moves into the contract approval stage.

University C (2024: Online)

**Extract 10-Financial Evaluation Policy:**

-The Academic Affairs Office organizes evaluations by internal and external experts, typically with a panel of at least five members, to conduct a two-tiered assessment process. For laboratory construction projects, safety evaluations are also conducted, and expert opinions on safety are required. For high-value equipment (over 500,000 yuan), an additional shared utilization assessment is conducted to ensure maximum usage and efficiency.

University C (2024: Online)

## **Appendix D**

### **E-learning policy at University D**

#### **Extract 1-University's Mission and Goals:**

-To actively support regional economic and social development, with a well-developed campus, leading teaching reforms, high teaching quality, and strong academic programs. Focusing on cultivating applied talents, with a distinctive emphasis on practical education. The goal is to position the university as a leader among private universities in the province, with top-tier educational and talent development capabilities, ultimately becoming one of the best private universities in the country.

University D (2024: Online)

#### **Text 1-E-learning Plan (2021-2025):**

-Campus information infrastructure will prioritize enhancing the well-being of both faculty and students, alongside fostering holistic student development, as core goals of Education Informatization 2.0. By incorporating digital innovations into teaching and school management, this initiative aims to support the central missions of moral education and talent cultivation. The plan will rely on a data-driven approach to implement deep educational reforms, ultimately seeking to establish a modern educational ecosystem that nurtures meaningful growth in schools. A key focus will be on integrating information technology into educational practices, with guiding principles centered around problem-solving, goal-setting, and optimizing benefits. This sustainable e-learning models are designed to create a modern, intelligent campus environment that improves teaching quality and promotes educational reform.

-The guiding principles for this Informatization will be underpinned by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and the spirit of the National Education Conference. These principles will emphasize the integration of information technology with educational practices, ensuring that real needs are addressed effectively. The approach will focus on high-level planning, coordinated implementation, and continuous goal-setting. A unified digital foundation will be established to integrate services and prioritize ease of application, with the ultimate aim of solving existing educational challenges and meeting evolving demands. Innovation and integration will be key, as the merging of the internet and education drives changes in educational philosophy, teaching methods, and evaluation. Additionally, a collaborative ecosystem will be fostered, promoting data sharing and a user-centered approach that breaks down data silos and supports collective development.

-The development goals of this initiative aim to build a fully integrated “smart campus” that combines physical and virtual learning environments into a cohesive, data-driven space. Innovations in educational services and data management will help transition from a teacher-centered model to one that places students at the core of the learning process. A learner-centered ecosystem will be developed to provide more personalized, accessible, and flexible learning experiences for students. This shift in focus will support a broader vision of transforming education into a more modern and

adaptive system, with the power to meet the needs of both teachers and learners in the digital age.

-Priority initiatives outlined in the plan will include establishing a cloud-based smart campus infrastructure that enables cross-departmental data sharing through high-speed networks and intelligent services. Additionally, the creation of a smart learning environment will modernize classrooms and offer flexible, anytime-anywhere access to educational resources. A data-driven evaluation system will also be implemented to provide personalized assessments for students and teachers, powered by AI and big data. Governance will be enhanced through a one-stop e-learning platform to streamline administrative support and improve efficiency. Efforts will also focus on increasing digital literacy for faculty and students, combining technical skills with problem-solving capabilities to ensure that all members of the academic community are equipped for the digital transformation. Finally, a smart security system will be put in place to ensure cybersecurity, with proactive monitoring and emergency response protocols to safeguard data and information.

-Support measures for the successful implementation of these initiatives will include the establishment of collaborative leadership across departments to drive the pace of Education Informatization. Policies will be developed to support priority digital projects and encourage innovation, ensuring that all stakeholders are aligned with the broader goals of the plan. Increased funding from various sources will be essential to sustain digital projects, particularly those focused on teaching technology and smart learning environments. Strengthening cybersecurity initiatives and providing regular awareness programs will further ensure the security and reliability of the digital campus environment. By implementing these support measures, the plan aims to create a sustainable, robust, and effective digital ecosystem that enhances the educational experience for all stakeholders.

University D (2021: Online)

**Extract 2-Online Course Completion Certificates Policy:**

-During course operation, instructors must ensure timely posting of course information, regular updates to resources, and address student inquiries within three working days. Each course must include at least four assignments to ensure active student engagement. Certificates are available for select high-quality provincial and university-level online courses, verifying students' completion of these programs and their corresponding learning achievements.

University D (2024: Online)

**Extract 3-Technical support guidelines:**

-Everyday technical assistance, such as troubleshooting hardware issues, software installation, and network connectivity are available for students and faculty 24/7.

-Any technical issues or support are provided by LMS Companies such as Treenity, Superstar, iFlytek, and Chaoxing Panya.

University D (2024: Online)

**Extract 4-Network and Data Security:**

-The establishment of 24-hour security monitoring during critical periods, as outlined in the "Network Security Guarantee System," ensures that e-learning platforms are accessible and secure at all times.

University D (2024: Online)

**Extract 5-Policy for Designing and Developing online & Hybrid Courses:**

-Faculty are encouraged to upgrade existing online courses by incorporating knowledge graphs, enhancing course content and applications.

-Courses approved through the university's evaluation process will receive funding support based on the specific course content and needs.

-Courses should integrate online tests, discussions (both online and offline), online assignment submissions with feedback, and online community forums. These activities aim to promote resource sharing, problem-solving, and collaborative learning among teachers and students, as well as between students.

University D (2024: Online)

**Extract 6-Hybrid Courses Evaluation and Data-Driven Policy:**

-Fostering the seamless integration of information technology with quality management. Managing teaching quality and monitoring basic data for learning activities. Ensuring that quality assurance processes are informed by real-time data and are scientifically managed through informatization.

University D (2024: Online)

**Extract 7-Financial Resource Allocation and Funding Policy:**

-Investing in E-learning projects should be a phased approach with a clear focus on essential educational technology upgrades, infrastructure, faculty development, and long-term educational impact. The methodical allocation of funds and emphasis on evaluation, security, and self-financing.

University D (2024: Online)

**Extract 8-Financial Procurement for e-learning platforms and infrastructure**

-Creating annual financial budget and procurement plan based on budgeting requirements and submit to the Finance Office and Tendering Office. The Tendering Office compiles and reviews all tender plans, while the Finance Office audits the corresponding budgets to ensure accuracy and compliance.

-Procurement Process: Departments first confirm their procurement needs by completing an approval form and preparing required documents. These are then submitted to the relevant management department, which, along with the education department, reviews the requests based on institutional needs. Once reviewed, budgets and plans are sent to school leaders for approval, followed by final authorization from the board. After approval, the Tendering Office finalizes tender materials and initiates the procurement process.

-Procurement Requirements: For purchases between 50,000 and 200,000 yuan (including goods, services, and small construction projects), the requesting department manages procurement with assistance from relevant personnel and suppliers. For larger projects exceeding these amounts, a formal tendering process is

required. Tender documents are prepared according to regulations and posted publicly for at least five working days to ensure fair competition.

-Policy Implementation: The procurement process follows strict oversight. Bidding requires at least three valid submissions; otherwise, the process is halted. The entire procedure is recorded for transparency. For complex projects, review experts are randomly selected from an official database, or handpicked with approval if necessary. Once a supplier is chosen, a contract is drafted and approved. After successful project completion, the Finance Office processes payments, and all records are archived for accountability.

University D (2024: Online)



## **Appendix E**

### **Pedagogical Requirements of Education Infomatization 2.0**

#### **Extract 1-Pedagogical Requirements A: Premium Online Courses in Higher Education**

##### Development and Enhancement of Online Courses

- National Online Open Courses: Develop and promote national high-quality online open courses to improve the accessibility and quality of higher education.
- Innovative digital Content: Incorporate advanced technologies and innovative teaching methods into course content to enhance learning outcomes and engagement.

##### Resource Integration and Utilization

- Resource Sharing Platforms: Establish platforms for sharing high-quality educational resources, including courses and teaching materials, across higher education institutions.
- Collaborative Development: Encourage collaboration among universities to develop and share high-quality courses that leverage each institution's strengths.

##### Promotion and Evaluation

- First-class online courses: Identify and promote exemplary First-class courses in higher education to set benchmarks and encourage widespread adoption of best practices.
- Quality Assessment and Recognition: Implement rigorous evaluation standards and recognition systems for high-quality courses to ensure they meet national and international educational standards.

#### **Extract 2-Pedagogical Requirements B: Enhancement of Digital Literacy**

##### 1. Assessment of Students' e-readiness

-Development of Evaluation Systems: Create a comprehensive system to evaluate and assess the information literacy of students, encompassing both technical skills and ethical awareness.

-Large-Scale Assessments: Conduct large-scale assessments to gauge the information literacy levels of students across different regions and educational stages.

##### 2. Digital literacy courses

-Curriculum Integration: Integrate information literacy into the curriculum across all levels of education, ensuring that students develop critical digital skills.

-Ethics of use Data: Incorporate information ethics into educational programs to foster responsible use of technology and information.

##### 3. Faculty's Professional development in digital literacy and pedagogical skills

-Training Programs: Implement training programs for Faculty to improve their information literacy and ability to teach related skills.

-Innovative Teaching Methods: Encourage the use of innovative teaching methods

that leverage technology to improve information literacy education.

#### 4. Students' digital literacy

-Training for Student digital literacy: Focus on cultivating information literacy among students as a fundamental quality, preparing them for the demands of the digital age.

-Collaborative Learning Environments: Foster collaborative learning environments that encourage the sharing of information and the ethical use of digital resources.



## **Appendix F**

### **Technological Requirements of Education Informatization 2.0**

#### **Extract 1-Technological Requirements A:**

##### 1. Infrastructure Development

-Broadband Connectivity: Ensure that every school is connected to the internet with adequate bandwidth to meet the needs of information technology-based teaching.

-Smart Devices: Promote the widespread use of wireless campuses and smart devices within educational institutions to facilitate advanced learning and teaching methods.

##### 2. Digital Resource Integration

-Resource Platforms: Develop and integrate digital educational resource platforms that provide teachers and students with access to a wide array of learning materials and tools.

-Management Systems: Implement digital management systems that streamline administrative processes and enhance the efficiency of educational institutions.

##### 3. E-learning Environment

-Learning and Teaching Tools: Equip institutions with modern IT tools that support both synchronous and asynchronous learning, including virtual labs and simulation environments.

-Interactive Platforms: Create interactive platforms that facilitate collaboration among students and between students and teachers, enhancing the learning experience.

##### 4. Sustainable Development

-Ongoing Upgrades: Continually upgrade digital infrastructure to keep pace with technological advancements and emerging educational needs.

-Training and Support: Provide ongoing training for educators and administrative staff to effectively use and maintain the digital campus infrastructure.

#### **Extract 2-Technological Requirements B: Smart Education**

##### 1. Innovation and Technological Advancement

-Smart Education Zones: Establish over ten smart education demonstration zones in strategically important and technologically advanced areas to pilot innovative educational practices.

-Next-Generation Educational Technologies: Implement cutting-edge technologies such as artificial intelligence (AI), Internet of Things (IoT), and blockchain to transform educational methodologies and infrastructures.

##### 2. Fostering e-Learning Environments

-Intelligent Teaching Support: Develop AI-driven environments that support personalized and adaptive learning for students, enhancing engagement and educational outcomes.

-Smart Classrooms: Build smart classrooms that integrate advanced digital tools to facilitate interactive and immersive learning experiences.

### 3. Curriculum and Content Innovation

-AI in Curriculum Development: Integrate AI and other smart technologies into curriculum development to provide dynamic and responsive educational content.

-Virtual and Augmented Reality: Utilize virtual and augmented reality technologies to create engaging and experiential learning environments for students.

## **Extract 3-Technological Requirements C: Data-Driven Decision-making (IT Governance)**

### 1. Enhancement of Education Management Systems

-Information System Integration: Complete the integration of education governance information systems to facilitate data sharing and business collaboration across different levels of educational administration.

-Data-driven decision-making: Employ advanced technologies like cloud computing and big data to support and enhance educational administration, decision-making, and public services.

### 2. Improvement of Administrative Efficiency

-Policy and Regulation: Enhance the management level of education through optimized management information systems and deepened application of big data in education.

-Systematic Data Collection: Implement a comprehensive data collection strategy that ensures data is collected once at the source and used across multiple platforms, improving the efficiency and accuracy of educational governance.

## **Appendix G**

### **Education Informatization 2.0 Action Plan**

#### **Goals, Significance, and Challenges**

#### **Extract 1-Challenges**

-The Education Informatization 2.0 Action Plan marks a pivotal moment in harnessing the transformative power of IT within the education sector. After years of trial and refinement, the revolutionary potential of technology in education has begun to take shape. Yet, the gap between current progress and the demands of the modern era remains substantial. The development and accessibility of digital educational resources are still lagging; the deployment and effectiveness of e-learning environments remain inadequate; although faculty possess basic IT skills, their ability to innovate within the realm of pedagogical use of technologies is notably constrained; the integration of e-learning into curriculum delivery remains superficial; and the shortage of advanced research and practical expertise persists.

#### **Extract 2-Significance**

-Education informatization is viewed as a crucial endogenous driver within the broader systemic transformation of the education sector, supporting and advancing the modernisation of education. This shift catalyses the evolution of educational philosophies, the reconfiguration of teaching models, and the restructuring of institutional frameworks, positioning China at the vanguard of global education informatization. It allows the country to offer valuable insights and strategies to inform global education. The new era has endowed Education Informatization with an urgent mandate, propelling it from its 1.0 phase into the 2.0 phase.

-To accelerate this transition, the Education Informatization 2.0 Action Plan has been introduced. This initiative is a crucial operational plan for speeding up the modernization of education. Without informatization, modernization is unattainable; it is the cornerstone and a defining feature of educational reform, forming a central pillar of the 'Education Modernization 2035' agenda.

-Education informatization offers unparalleled advantages: it removes the traditional constraints of time and space, enables rapid dissemination and replication of information, and supports diverse modes of presentation. These capabilities will undoubtedly serve as key enablers of educational equity and quality. Furthermore, they will underpin the creation of ubiquitous learning environments, facilitating lifelong learning for all. Importantly, it also promises to enhance data-driven decision-making and integrated IT governance. By leveraging informatization as the cornerstone of educational modernization, China is making a strategic move that carries profound implications for becoming a global leading role and a highly skilled workforce.

### **Extract 3-Strategic goals**

-The Education Informatization 2.0 Action Plan is set to achieve a series of ambitious strategic objectives, including the universal provision of e-learning tools to faculty, ensuring that these tools are accessible to all eligible students, and establishing robust smart campus infrastructure across educational institutions. Furthermore, the plan aims to elevate the overall level of informatization and enhance the digital literacy of faculty and learners. A cornerstone of the initiative is to fostering an expansive "Internet + Education" (e-learning) platform, designed to facilitate the shift from narrowly tailored educational resources to a more expansive ecosystem of e-learning resources. This evolution goes beyond merely improving basic IT skills, aiming instead to foster a broader culture of digital literacy and smart education. Ultimately, the plan aspires to establish new paradigms for talent cultivation within the "Internet plus" framework, promote the proliferation of internet-based educational services, and pioneer novel approaches to IT governance in an increasingly digitalised world.



## **Appendix H**

### **Support Mechanism of Education Informatization 2.0**

#### **Extract 1-Strengthening Leadership and Coordinated Advancement**

-The Ministry of Education plays a central role in formulating overarching policies, guiding education reform at all levels, and addressing regional disparities in development. Local education authorities are required to enhance leadership structures for Educational Informatization, integrating institutions within the education system and leveraging the expertise of relevant enterprises. A streamlined and efficient technical support mechanism for educational Informatization should be explored and established. All schools should adopt a system whereby school leaders serve as Chief Information Officers (CIOs), ensuring clear responsibilities and comprehensive planning for digital transformation. Furthermore, Informatization will be recognised as a key metric in regional education modernization frameworks. Systematic evaluations, including third-party assessments, will be conducted to improve the efficiency, effectiveness, and impact of Education Informatization across different regions and institutions.

#### **Extract 2-Innovative Mechanisms and Diversified Investment**

-Local authorities must fully implement national policies that permit educational funding to be used for procuring e-learning technologies and services, thereby increasing investment in Education Informatization. The Education Informatization 2.0 initiative should be integrated with broader strategies such as Internet Plus, big data, cloud computing, smart cities, digital inclusivity, Broadband China, the digital economy, and next-generation artificial intelligence. A balanced approach that combines both governmental and market-driven efforts is essential. Policy environments should foster investment from enterprises, enabling them to provide high-quality digital products and services. This approach will ensure diversified funding and collaborative advancement.

#### **Extract 3-Pilot Programmes and Enhanced Training**

-A pilot-first approach will be maintained, with targeted regional and specialised digitalisation trials leading the way. Best practices and successful models will be refined and widely promoted through on-site observation sessions, exhibitions, and the publication of exemplary case studies. These initiatives will facilitate a scalable and impactful rollout of educational Informatization. A key priority of the Education Informatization 2.0 initiative is the development of human capabilities. Large-scale training programmes will be implemented for teachers, school leaders, and administrators at all levels, with innovative approaches to enhance their effectiveness. Traditional and new media will be utilised in combination to establish a multi-tiered and sustainable communication strategy, fostering a supportive public discourse.

#### **Extract 4-Open Collaboration and International Outreach**

-China will continue to collaborate with and actively participate in the educational **informatization** initiatives of international organisations such as UNESCO and

UNICEF. Strengthening international exchange and cooperation—particularly with countries along the Belt and Road Initiative—will be a priority. Chinese examples in educational **informatization** will be actively promoted to enhance global influence and discourse. Academic collaboration will be deepened through the establishment of research partnerships, international research centres, and expert exchange programmes. Chinese experts will be encouraged to engage in global academic forums and contribute to the work of international organisations. Practical cooperation will also be enhanced, fostering collaboration between Chinese and foreign schools, school leaders, teachers, and professional institutions. By sharing innovations in pedagogy and best practices, mutual learning and collective progress will be achieved. Additionally, Chinese enterprises in the educational digitalisation sector will be supported in expanding their global presence, further strengthening China’s international standing in education.

### **Extract 5-Responsibility and Security Assurance**

-The leadership of the Communist Party within the education system will be reinforced to ensure robust governance of cybersecurity and digitalisation efforts. Senior leaders will bear primary responsibility for cybersecurity, and a coordinated leadership framework will be established to ensure the integration of digitalisation and cybersecurity planning. A comprehensive cybersecurity supervision and evaluation system will be implemented, with cybersecurity responsibilities embedded in leadership performance assessments. Legal frameworks such as the Cybersecurity Law will guide the development of a strong cybersecurity infrastructure within the education sector. The cybersecurity grading protection system will be strictly enforced, and advanced monitoring and early warning mechanisms will be developed to enhance situational awareness. Key information infrastructure will be safeguarded, with particular emphasis on data security and privacy protection. A structured approach to secure data sharing will be implemented, balancing stringent security with controlled access. These measures will ensure the protection of the rights and interests of students and educators.

**Appendix I**  
**Consent to Participation in Research (Semi-structured Interviews)**

**INSTITUTIONAL E-LEARNING POLICY IN CHINESE ACADEMIC  
HIGHER EDUCATION: AN INTEGRATIVE PERSPECTIVE ON FINANCIAL,  
HUMAN, AND TECHNICAL FACTORS**

Please mark each box with a  $\checkmark$  to indicate agreement.

- I have been given and have understood an explanation of this research project and the confidentiality conditions.
  
- I have had an opportunity to ask questions and have them answered to my satisfaction.
  
- I agree to be interviewed by Kai Hu for the purpose of this study, and I consent to the use of my perceptions, experiences, opinions, and information in this research provided they are not attributed to me.
  
- I understand that I will be given the opportunity to review and comment on the summary of the interviews.
  
- I understand that all data collected (tapes and interview transcripts) will be destroyed two years after the completion of the project.
  
- I understand that I may withdraw from this project at any time up until 31st March 2025, and that in this instance, all data collected (tapes and interview transcripts) will be immediately destroyed and excluded from the study.
  
- I would like to receive feedback on this research, in the form of a research summary.
  
- I understand that the collected, collated, and analyzed data will be published in case studies, academic journals, and/or presented at conferences.
  
- I confirm that I DO / DO NOT have the approval of my employer to participate in this research project.

I agree to have interviews digitally recorded (audio) YES  / NO

Name: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

**Appendix J**  
**Consent to Participation in Research (Focus Group Discussions)**

**INSTITUTIONAL E-LEARNING POLICY IN CHINESE ACADEMIC  
HIGHER EDUCATION: AN INTEGRATIVE PERSPECTIVE ON  
FINANCIAL, HUMAN, AND TECHNICAL FACTORS**

Please mark each box with a  $\surd$  to indicate agreement.

I have been given and have understood an explanation of this research project and the confidentiality conditions.

I have had an opportunity to ask questions and have them answered to my satisfaction.

I agree to be interviewed by Kai Hu for the purpose of this study, and I consent to the use of my perceptions, experiences, opinions, and information in this research provided they are not attributed to me.

I understand that all data collected (recordings and interview transcripts) will be destroyed two years after the completion of the project.

I understand that I may withdraw from this project before the start of the discussion since I cannot withdraw information provided by me from the focus group once it is recorded.

I would like to receive feedback on this research, in the form of a research summary.

I agree to have interviews digitally recorded (audio and video) YES  / NO

Name: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

**Appendix K**  
**Letter Inviting Participants to Review Findings**

1st March 2025

Dear Participant,

**Re: INSTITUTIONAL E-LEARNING POLICY IN CHINESE ACADEMIC  
HIGHER EDUCATION: AN INTEGRATIVE PERSPECTIVE ON  
FINANCIAL, HUMAN, AND TECHNICAL FACTORS**

Thank you again for your valuable participation in my study. I am now in the final stages of data analysis and would like to invite you to review a draft summary of the findings to ensure your views have been accurately represented.

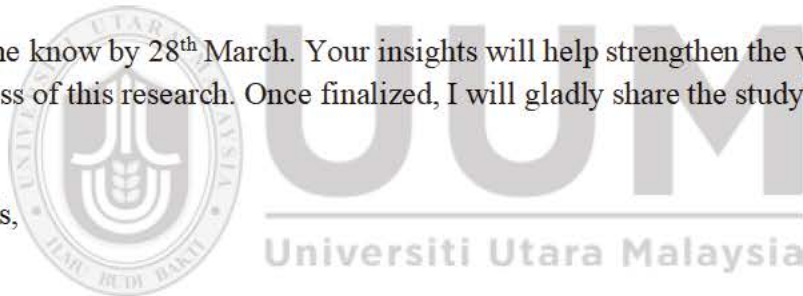
The draft highlights key themes across financial, human, and technical dimensions of e-learning policy. If you're willing to provide feedback, I can send a copy of the draft or a shorter summary, depending on your preference.

Please let me know by 28<sup>th</sup> March. Your insights will help strengthen the validity and completeness of this research. Once finalized, I will gladly share the study's results with you.

Best regards,

Kai Hu  
Doctoral Candidate  
School of Education  
Universiti Utara Malaysia  
Email: hu\_kai@ahsgs.uum.edu.my

Supervisor: Prof. Dr. Arumugam  
School of Education  
Universiti Utara Malaysia  
Email: arumugam@uum.edu.my



**Appendix L**  
**Letter to Participants to Review Transcript**

Dear Participant,

Thank you once again for taking part in my research and for your interest in the study. As we discussed, I've attached a copy of the transcript from our recent interview. Here are a few important notes:

- 1 I've removed any names or details that could identify you.
- 2 If part of the audio was unclear, I've added clarifications in parentheses.
- 3 Please let me know if you notice any mistakes or if there's anything you'd like to change or remove.
- 4 Feel free to share any extra thoughts or comments about the interview or the topics we talked about.

I truly appreciated your time and your help with this research.

Sincerely,

Kai Hu  
Doctoral Candidate  
School of Education  
Universiti Utara Malaysia  
Email: hu\_kai@ahsgs.uum.edu.my



Supervisor: Prof. Dr. Arumugam  
School of Education  
Universiti Utara Malaysia  
Email: arumugam@uum.edu.my

**Appendix M**  
**DATA COLLECTION FOR PERMISSION**



PUSAT PENGAJIAN PENDIDIKAN  
SCHOOL OF EDUCATION  
College of Art and Sciences  
Universiti Utara Malaysia  
06010 UUM SINTOK  
KEDAH DARUL AMAN  
MALAYSIA



Tel: 604 - 928 5381  
Faks (Fax): 604 - 928 5382  
Laman Web (Web): [www.cas.uum.edu.my](http://www.cas.uum.edu.my)

Our Ref. : UUM/CAS/SOE/P-74/1  
Date : 31 July 2024

**TO WHOM IT MAY CONCERN**

Dear Sir/Madam

**DATA COLLECTION FOR PROJECT PAPER/THESIS**

This is to certify that the following student is currently conducting a field study and data collection as partial requirements of the graduate studies.

**Name : Hu Kai**

**Matric No. : 905950**

**Course : Doctor of Philosophy (Education)**

**Thesis Title : Title of Research: A Study of Institutional E-Learning Policy  
in the age of Education Information II in China Academic  
Higher Education Institutions: An Integrative Perspective  
Consisting of Human, Financial and Technical Factors.**

For further information regarding the research work of the project paper/thesis, you may get in touch with Associate Professor Ts. Dr Arumugam Raman, the supervisor at +60 16-4915014 or email to [arumugam@uum.edu.my](mailto:arumugam@uum.edu.my).

We sincerely hope your organisation will be able to assist the student for the data collection process.

Thank you

**"MALAYSIA MADANI"**

**"SERVING THE NATION"**

**"KEDAH SEJAHTERA – NIKMAT UNTUK SEMUA"**

**"KNOWLEDGE, VIRTUE, SERVICE"**

Upholding the principles of trust and integrity

  
**NUR AZHANIE BINTI MOHD KAMIL**  
Assistant Registrar  
School of Education  
p.p. Dean

Universiti Pengurusan Terkemuka  
The Eminent Management University



**Appendix N**  
**Verification of Chinese-English Transcripts by Two Coders**



**湖北理工學院**  
HUBEI POLYTECHNIC UNIVERSITY

To Whom It May Concern,

**Subject: Confirmation of Translation and Verification of Chinese-English Transcript**

This letter serves to formally confirm that the Chinese audio-taped transcripts of data gathered from semi-structured and focus group interviews, as well as policy documents and survey responses related to the Ph.D. dissertation titled *A Study of Institutional E-Learning Policy in the Age of Education Informatization II in Chinese Academic Higher Education Institutions: An Integrative Perspective Consisting of Financial, Human, and Technical Factors*, have been faithfully translated into English.

To ensure the highest standards of quality, the translated materials were meticulously reviewed by Professors Zhang Jian and Zhang Meilin, both distinguished linguists with expertise in Chinese and English. They have confirmed that the translation accurately conveys the original meaning and nuances of the Chinese texts. The linguistic experts have validated that the translation adheres to the necessary standards for clarity, coherence, and contextual accuracy.

This thorough verification process guarantees the reliability and integrity of the translated transcripts. Should you require further information, please do not hesitate to contact us.

Thank you for your consideration of this matter.

Sincerely

*Prof. Zhang Jian*

Dean  
School of Foreign Languages  
Hubei Polytechnic University  
Email: [210013@hbpu.edu.cn](mailto:210013@hbpu.edu.cn)

*Prof. Zhang Meilin*

Vice Dean  
School of Foreign Languages  
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电话: 0714-6353390 传真: 0714-6356808 网址: <http://www.hbpu.edu.cn>

**Appendix O**  
**Guiding Interview Questions**

Age (Range: 20-30; 31-40; 41-50; 51-60)

Gender: Male/Female

Your Identity: Student/Faculty/IT/Administrators

Administrators: Department \_\_\_\_\_ Title \_\_\_\_\_

Faculty: Department \_\_\_\_\_ Teaching area \_\_\_\_\_ Title \_\_\_\_\_

IT: Department \_\_\_\_\_ Title \_\_\_\_\_

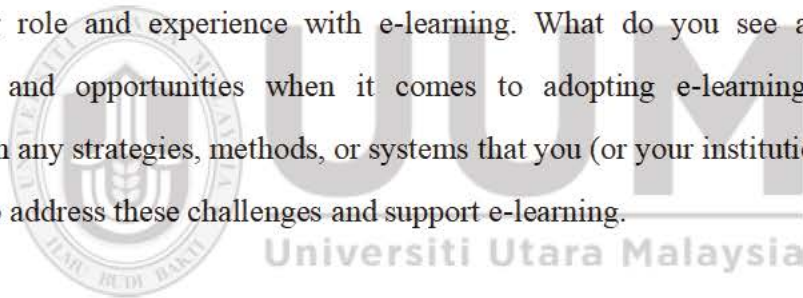
Student: Department \_\_\_\_\_ Major \_\_\_\_\_ Year \_\_\_\_\_

Focused Group Interviews (45 minutes)

Semi-structured Interviews (30-45 minutes)

Interview outline:

Thank you so much for participating in my research. To begin, I'd like to learn more about your role and experience with e-learning. What do you see as the main challenges and opportunities when it comes to adopting e-learning? I'm also interested in any strategies, methods, or systems that you (or your institution/program) are using to address these challenges and support e-learning.



## Appendix P

### Semi-structured Interviews (Administrators)

<b>Intentions Behind Policy Development</b>	What were the primary goals and intentions when your institution developed its e-learning policies? How do these objectives reflect the institution's commitment to integrating e-learning?
<b>Policy Formulation Process</b>	Could you describe the process your institution followed to formulate its e-learning policies? Who were the key stakeholders involved, and how did their input shape the policies? Was there a committee that included faculty members, IT specialists, and student representatives who contributed to the policy? If faculty feedback highlighted the need for training by using more advanced features of platforms, how was this incorporated into the final policy?
<b>Top-Down vs. Bottom-Up Policy Design</b>	How does the administration communicate new policies or updates to faculty/students/IT? Do you think this process is effective? Why or why not?
<b>Tensions Between Financial Investment and Institutional Needs</b>	What factors are prioritized when deciding which tools to invest in (e.g., cost, institutional goals, faculty needs, student engagement)? How do you ensure that the tools selected align with the specific teaching and learning needs of faculty and students? In your opinion, do the tools and technologies currently in use meet the practical needs of faculty and students? Why or why not? How do you gather input from faculty or students to determine what tools or resources are most needed before making purchases? Have there been instances where tools or technologies were purchased but underutilized? What do you think were the reasons behind this?
<b>Tensions Between Budget Allocation for Infrastructure vs. Pedagogical Support</b>	How does your institution determine the proportion of budget allocated to technological infrastructure versus pedagogical support? What factors are typically prioritized when deciding how to allocate funding between e-learning platforms/tools, digital content, developing premium courses, pedagogical/digital literacy training, emerging technologies, high-end infrastructure, technology maintenance or upgrades? (Mark each one of these initiatives by the following benchmark: Top, high, medium-high, medium, medium-low, low, very low)
<b>Tensions Between Inadequate Funding for Ongoing Maintenance and Support</b>	When allocating funds for e-learning tools, how much consideration is given to ongoing costs such as maintenance, updates, and technical support? Have there been instances where a tool became outdated or unusable due to lack of maintenance? If so, how was this addressed? What feedback have you received from faculty or students regarding issues with outdated tools or insufficient technical support? How does your institution prioritize funding for ongoing support compared to acquiring new technologies?
<b>Tensions between Financial Investment in Technologies vs. Pedagogical Alignment</b>	To what extent are pedagogical goals and teaching strategies considered when allocating budgets for e-learning tools? How often do you engage faculty in discussions about the pedagogical utility of tools before making purchasing decisions? Have you observed cases where technologies were underutilized due to lack of pedagogical alignment? What were the reasons?
<b>Cost-effectiveness</b>	How does your institution assess whether e-learning investments are cost-effective? How do the policies help you determine whether the benefits of a new e-learning tool justify its cost? In what ways do the current e-learning policies help maximize cost-effectiveness when implementing and maintaining e-learning systems? Are there specific policies that encourage the use of cost-effective tools or strategies in your technology adoption? How do you see your institution's policies changing to better manage initial investments and ongoing costs while ensuring long-term cost-effectiveness for e-learning systems?
<b>Evaluating Policy Effectiveness</b>	How do you assess institution's e-learning policies? What metrics or outcomes do you use to measure their success? Do you measure success through student engagement rates, faculty adoption rates, or improvements in learning outcomes?

## Appendix Q

### Semi-structured Interviews (Faculty)

<b>Technical Assistance</b>	How does the institutional e-learning policy influence the availability and quality of technical assistance provided to you? Can you describe any experiences where the technical support you received either helped or hindered your ability to use e-learning tools effectively?
<b>Library and Help Desks</b>	How does the support provided by the library/help desks/IT impact your use of e-learning systems? How have the resources or assistance from these services affected your ability to find and use e-learning materials?
<b>Information Accessibility</b>	In what ways does the institutional e-learning policy ensure that relevant information and resources are easily accessible to you? how do you access guidelines, tutorials, or updates about the e-learning tools you use? Have these resources been helpful?
<b>E-learning Environment</b>	Does your institution have dedicated spaces or facilities designed for e-learning, such as smart classrooms? How well-equipped are these smart classrooms in terms of hardware, software, and technical support? How does your institution facilitate communication and interaction among faculty and IT specialists regarding e-learning practices? Can you provide examples of platforms, forums, or events that enable knowledge sharing and collaboration?
<b>Ease of Use</b>	How do institutional e-learning policies impact the ease of use of the e-learning tools and platforms available to you?
<b>Alignment of Digital Tools with Teaching Needs</b>	Has your institution provided the necessary tools and resources to help you achieve your course objectives? Are there any digital tools or software that you find particularly useful but are not purchased or licensed by your institution, requiring you to pay for them personally?
<b>Efficiency and Financial Decision-Making</b>	Have you encountered challenges in teaching due to limited access to digital resources—such as needing to pay for third-party tools that the institution does not provide? Do you think financial resources currently allocated to e-learning are being used in the most effective ways? Which areas should be prioritized for funding to better support faculty needs? (e.g., e-learning platforms/tools, digital content, developing premium courses, pedagogical/digital literacy training, emerging technologies, high-end infrastructure, technology maintenance or upgrades )
<b>Budget Allocation and Faculty Involvement</b>	Are faculty involved in discussions on how to balance the budget between digital infrastructure and teaching support? Do you believe the university should prioritize funding for faculty training in its e-learning strategy?
<b>System Maintenance and Impact on Teaching</b>	How does the institution balance investment in new platforms and technologies with the need to maintain and update existing systems? How reliable are e-learning platforms/tools provided by the university? Have there been any instances where technical failures disrupted your teaching? Are there any current software/hardware that no longer meet your needs due to lack of updates or maintenance? In what ways has insufficient system or equipment maintenance and support affected your ability to use digital education tools effectively?
<b>Impact on IT Literacy</b>	How has the institutional support influenced your development of IT literacy? have the training and resources provided by the institution helped you improve your technical skills? If so, how?
<b>Impact on Pedagogical Skills</b>	In what ways has the institutional support impacted your development of pedagogical skills related to e-learning? how have the policies and support services helped you adapt your teaching methods to better use e-learning tools?
<b>Feedback and Improvement</b>	How do you provide feedback on the e-learning support and tools available to you? Has your feedback led to any improvements in the support or tools? How responsive has the institution been to your input?

## Appendix R

### Focus group Interviews (Faculty)

<b>Faculty- Institutional Support for Faculty-Training Opportunities</b>	What types of training programs does your institution offer to help faculty develop the skills needed for online/hybrid teaching? Can you share your experiences with these training programs? How effective do you find the training provided in enhancing your IT literacy and pedagogical skills? What improvements would you suggest?
<b>Faculty vs. Administrators: Assessment of Student Engagement</b>	How do you perceive the metrics (e.g., login frequency, participation in online discussions, quiz completion rates) used to track student engagement in your e-learning courses? Do you think they accurately reflect genuine student engagement? How do you assess student engagement in your courses beyond the traditional metrics?
<b>Faculty vs. IT Staff: Technical vs. Pedagogical Needs Incentives for Developing Online Courses/Premium Courses Professional Development Opportunities- Recognition of Online Teaching</b>	How well do you think IT understands the teaching needs of faculty? In your opinion, how well does the IT team integrate pedagogical goals into the system design and maintenance process? What incentives does your institution offer to encourage faculty to develop online courses? How do you perceive these incentives? Have these incentives influenced your decision to create or enhance online courses? If so, how? How does your institution recognize and reward online/hybrid teaching in promotion and tenure decisions? Can you provide specific examples? Do you feel that online teaching is valued equally compared to traditional teaching methods in your institution? Why or why not?
<b>Access to Advanced E-Learning Technologies</b>	What advanced e-learning technologies are available to faculty at your institution? How have these technologies influenced your teaching practices? Are there any specific tools or platforms that you find particularly beneficial or challenging? Please elaborate.
<b>Policy Expectations and Actual needs of Faculty</b>	How would you describe policy expectations for what goals should you elevate your digital competency and pedagogical skills at your institution? Does your university provide faculty digital competency framework? Do policies at your institution provide clarification for its e-learning plans and strategies? Is there any ambiguities regarding specific terms or regulations in the policy texts?
<b>Challenges and Barriers- Inadequate Time</b>	How does the time required for developing online/hybrid courses affect your ability to engage in professional development and improve your teaching skills? What strategies have you employed to manage time effectively while balancing online course development and other responsibilities?
<b>Challenges and Barriers-Resistance to Change</b>	Have you encountered resistance from colleagues or administration when implementing e-learning practices? How has this affected your teaching? What factors do you think contribute to resistance to adopting e-learning?
<b>Pedagogical Shifts</b>	If your institution's e-learning policy encourages innovative pedagogy, how do you balance the innovative and traditional methods in your teaching? What challenges has this transitioning to innovative pedagogical methods had on you?
<b>Institutional Priorities- Administrative Goals vs. Educational Benefits</b>	In your opinion, do institutional initiatives prioritize administrative goals over genuine educational benefits? Please explain your perspective. How do you believe the focus on administrative goals affects faculty motivation and the quality of online education provided to students?
<b>Identifying Policy Gaps</b>	Are there any gaps in the current e-learning policies that you think create extra financial burdens or inefficiencies? Is there something the policies don't cover that ends up costing your institution more money or making things harder to manage?

## Appendix S

### Semi-structured Interviews (IT Specialists)

<b>Role in E-learning Policy Implementation</b>	Can you explain your role mandated in e-learning policies? As the e-learning guidelines mandated, do you help install and maintain the software or train faculty/students on how to use it? In your job duties, do you help develop e-learning tools or not? Why?
<b>Tensions Between Policy Mandates and Institutional Technical Expertise</b>	How well do you understand e-learning policies that mandate the use of specific tools or technologies? Are there aspects of e-learning policies that you feel are unrealistic given the institution's technical capacity? How do you handle situations where a mandated tool requires expertise beyond what your team currently possesses? How often does your team collaborate with external vendors or consultants to address technical challenges?
<b>Collaboration with Faculty and Administration</b>	How do e-learning policies help you work with faculty and administrators? Do you feel that communication is good and that you're able to provide the necessary support? Is there any formal communication channel for you to provide your feedback? Have you provided your feedback to institutional leaders?
<b>Complexity of Tool Integration with Legacy Systems</b>	What are the main challenges you face when integrating new e-learning tools with existing legacy systems at the institution? How often do you encounter compatibility issues between new tools and the institution's older systems? can you describe a specific instance when a tool's integration with legacy systems was particularly complex or problematic?
<b>Technical Resources for System Expansion</b>	What challenges do you encounter with the current technical infrastructure when supporting e-learning systems? Are there specific instances where the system failed or slowed down due to resource limitations? How were these issues resolved? How well do you think the current infrastructure meets the needs of expanding e-learning features, such as advanced multimedia or increased user access? Do you feel that policy goals for e-learning system expansion are realistic given the available technical infrastructure? Why or why not?
<b>Innovation and Implementation</b>	How do the e-learning policies encourage or restrict the adoption of new technologies? Can you provide examples of how emerging technologies have been integrated into the e-learning environment? How do you perceive faculty's current use of the e-learning platform? Are there specific features that you feel are underutilized by faculty?
<b>Faculty vs. IT Staff: Platform vs. Pedagogical Integration</b>	From your perspective, why do you think some faculty members focus on basic platform functions rather than exploring its full capabilities? Do you feel that faculty are aware of the platform's potential for collaborative learning, data analysis, or adaptive learning? Are there any features or tools that you think should be encouraged? Why? How often do you communicate with faculty/administrators for understanding their request? What common technical challenges do faculty encounter when using e-learning tools or platforms? Have you noticed any patterns in the tools or features that faculty find particularly difficult to use? Do you feel that your team is adequately equipped to support faculty/students when they use unfamiliar tools or features? Why or why not? How would you assess the general level of technical proficiency among faculty? Are there specific skills or areas of knowledge that you feel faculty lack when it comes to using e-learning tools?
<b>Stakeholder Interactions</b>	
<b>Challenges in Technological Adaptation</b>	If your institution is required to upgrade its servers to handle increased OL traffic, how do you managed the financial and logistical aspects of this upgrade? What were the obstacles, and how did you fix them?

## **Appendix T**

### **Semi-structured Interviews (Students)**

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#### **Technical Assistance**

How do you feel about the technical support provided by your institution for e-learning? When you have issues with e-learning tools or platforms, how quickly and effectively is help provided? How does this support affect your ability to stay engaged in your studies?

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#### **Library and Help Desks**

How do the library and help desks support your use of e-learning resources? Have you found the assistance from these services helpful when you need to find materials or resolve issues? How does this support influence your learning experience?

#### **Information Accessibility**

How easy is it for you to find the information and resources you need for your e-learning courses? Are the guidelines, tutorials, or course materials easily accessible? How does the availability of information impact your ability to succeed in your courses?

#### **E-learning Environment**

Can you describe smart classrooms and LMS platforms available to you as a student in your online or blended courses? How accessible and user-friendly are the e-learning technologies provided by your institution? Have you encountered any challenges in utilizing them for your studies? How would you describe the institutional culture regarding e-learning? Do you feel supported by your institution in adapting to online or blended learning environments? Please share your experiences. In what ways has the e-learning environment influenced your level of engagement and motivation in online or blended courses? Can you provide specific examples of how the environment has affected your participation and performance? How do you believe the e-learning environment and institutional support have impacted your learning outcomes and academic performance? Can you share instances where the environment has directly influenced your grades or understanding of course material?

#### **Ease of Use**

How easy or difficult is it for you to use the e-learning tools and platforms provided by your institution? Can you share any specific experiences where the usability of these tools affected your ability to complete assignments or participate in online classes?

#### **Impact on Digital Literacy**

How confident do you feel about your digital skills when using e-learning tools? Does your university provide assessment to evaluate your digital competency? (How well do you think your institution supports the development of your digital literacy? How does this impact your ability to engage with e-learning content?)

#### **Interactive Teaching Methods**

How does your institution's e-learning policy influence the way you interact and collaborate with your teachers? What teaching methods do your instructors apply in online or hybrid teaching? Do the e-learning regulation and guidelines make it easier or harder for you to communicate and work with your instructors? How does this affect your learning experience?

#### **Impact on Student Engagement**

How do the e-learning policies at your institution affect your motivation and engagement with your courses? Have you noticed any changes in how involved you feel in your studies because of the institutional commitment on e-learning, e-learning environment, institutional support?

#### **Learning Outcomes**

How do you think the e-learning support provided by your institution affects your academic performance and learning outcomes? How has the support (or lack of support) influenced your grades, understanding of the material, or overall satisfaction with your courses?

#### **Feedback and Improvements**

How do you provide feedback on the e-learning tools and support you receive, and how do you feel your feedback is handled by the institution? Have you seen any changes or improvements in response to feedback you or your peers have given?

#### **Future Needs and Suggestions**

(What improvements or changes would you suggest to make the e-learning environment and institutional support better for students in the future? Are there specific areas where you think more support is needed to help students succeed in their online/hybrid courses?)

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**Appendix U**  
**Focus group Interviews (Students)**

<b>Access to Dependable Resources</b>	How would you describe your access to reliable and up-to-date learning resources (e.g., digital learning materials, online libraries, & course content) in your online or blended courses? Can you provide specific examples?
<b>Robust Technical Support</b>	How would you rate the technical support available to you as a student in e-learning courses? Can you share an instance where you received helpful technical assistance? What additional resources or support do you believe are necessary to improve the technical assistance provided to Students?
<b>Adept Instructors</b>	How would you describe the level of expertise and support provided by your instructors in e-learning courses? Can you give examples of how their skills have facilitated your learning? In your opinion, how does the level of instructor support influence your engagement and participation in online or blended learning environments?
<b>Administrative Practices &amp; Communication-Transparent and Supportive Administrative Practices</b>	How transparent and supportive are the administrative practices related to e-learning in your institution? Can you provide examples of positive or negative experiences with administrative support? What aspects of administrative support do you find most valuable or lacking in enhancing your learning outcomes?
<b>Administrative Practices &amp; Communication-Clear Communication</b>	How effectively does your institution communicate information about e-learning policies, resources, and support systems to students? Can you share examples of clear or unclear communication you have encountered? What suggestions would you make to improve the clarity and timeliness of communication regarding e-learning support from your institution?
<b>Administrative Practices &amp; Communication-Flexible Policies and Responsive Support</b>	How flexible are the e-learning policies in your institution in accommodating diverse student needs? Can you describe any experiences where the policies have been responsive to your specific requirements? What aspects of e-learning policies do you believe could be improved to better support student engagement and learning outcomes?
<b>Perceptions of Online/Hybrid Education Quality-Perceived Quality of Online/Hybrid Courses and Materials</b>	How would you rate the overall quality of online/hybrid courses and learning materials provided by your institution? Can you provide examples of high-quality or low-quality elements you have encountered? What factors do you believe contribute to the perceived quality of online/hybrid learning in your institution? How do these factors shape your attitudes towards e-learning support?
<b>Impact on Engagement and Learning Outcomes-Influence on Engagement</b>	How do the institutional support systems for e-learning affect your level of engagement in online or blended courses? Can you share specific examples of how support has enhanced or hindered your engagement?
<b>Impact on Engagement and Learning Outcomes-Impact on Learning Outcomes</b>	In your opinion, how does the level of institutional support for e-learning influence your learning outcomes? Can you provide examples of how support has positively or negatively affected your academic performance?
<b>Closing Questions-Final Thoughts</b>	Is there anything else you would like to share regarding your attitudes towards institutional support for e-learning and its impact on your engagement and learning outcomes?

**Appendix V**  
**Tables for Sampling Population**

**University A:** Public Research University; Central China

**University B:** Public Application-oriented University; Central-east China

**University C:** Corporate University (Application-oriented); North-central China

**University D:** Corporate University (Application-oriented); North-east China

**Table V1 Age Ranges (Faculty, IT specialists, and Administrators)**

Age ranges	University A	University B	University C	University D
20-30	2	1	2	1
31-40	7	14	6	9
41-50	4	6	5	4
51-60	3	1	3	2

**Table V2 Types of Position (Faculty, IT specialists, and Administrators)**

Position	University A	University B	University C	University D
Department Head/Director	1	1	1	1
Dean/Director	1	1	1	1
Vice Dean	1	1	1	1
Professor	1	2	1	1
Associate Professor	2	5	4	5
Senior lecturer	7	9	8	7
Junior lecturer	5	7	4	4
IT Director	1	1	1	1
IT staff	1	1	1	1
Total	22	28	22	22

**Table V3 Year of Enrollment (Student)**

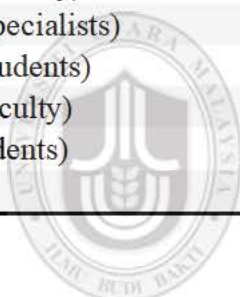
Year of Enrollment	University A	University B	University C	University D
Year One	0	0	0	0
Year Two	4	6	6	4
Year Three	4	4	4	6
Year Four	2	6	1	1
Year Five	2	2	1	1

**Table V4 Departments involved across four universities**

<b>Department</b>	<b>University A</b>	<b>University B</b>	<b>University C</b>	<b>University D</b>
School of Foreign Languages	1	1	1	0
School of Computing	0	1	1	1
School of Medical Care	1	0	0	1
School of Business	1	1	0	0
School of Science & Arts	0	1	0	0
School of Engineering	1	0	1	1
School of Nursing	0	0	1	1
School of Mathematics	1	1	1	1

**Table V5 Number of participants involved in Two Interview Types**

<b>Interview Types</b>	<b>University A</b>	<b>University B</b>	<b>University C</b>	<b>University D</b>	<b>Total</b>
Semi-structured (Administrator)	2	2	2	2	8
Semi-structured (Faculty)	6	6	6	6	24
Semi-structured (IT specialists)	2	2	2	2	8
Semi-structured (Students)	6	6	6	6	24
Focus group (Faculty)	6	12	6	6	30
Focus group (Students)	6	12	6	6	30
<b>Total</b>	<b>28</b>	<b>40</b>	<b>28</b>	<b>28</b>	<b>124</b>



Universiti Utara Malaysia

## Appendix W

### Rationale for Research Objectives

Research Objectives (RO)	Rationale for Research Objectives
RO1	<i>This objective stems from the limited understanding of how institutional e-learning policies are framed, communicated, and interpreted within academic HEIs. Prior studies (Huang &amp; Dai, 2021; Szeto, 2013; Liu-Schuppener, 2023) highlight that such policies often lack clarity and stakeholder engagement. A discourse analysis enables an in-depth examination of policy language to uncover hidden assumptions, power relations, and intended meanings about e-learning practice. This analysis contributes to understanding how policies shape, or fail to shape, stakeholder perceptions and actions within the institutional e-learning environment.</i>
RO2	<i>Despite national directives emphasizing digital transformation, the alignment between macro-level policies and institutional-level practices remains uncertain. Studies (Liu &amp; Guo, 2020; Yan 2020) suggest that academic HEIs struggle to interpret and operationalize national policies due to dependence on provincial oversight and limited institutional autonomy. This objective evaluates whether institutional policies adequately reflect the goals of Education Informatization 2.0—such as digital pedagogy, smart learning environments, and Data-driven—and identifies policy-practice gaps that hinder effective implementation.</i>
RO3	<i>Financial investment is a decisive factor in sustaining e-learning systems. The Act of Expanding Investment in Higher Education (2022) offers temporary relief, but many academic HEIs still face severe funding shortages for infrastructure, software, and training (MOE, 2022; IT Center of MOE, 2023). This objective examines how institutional policies plan, distribute, and justify financial resources for e-learning. It also explores whether these policies encourage cost-effective strategies and long-term investment in digital transformation.</i>
RO4	<i>Faculty play a central role in e-learning adoption, yet many academic HEIs offer limited or inconsistent training opportunities (The Information Technology Center of MOE, 2021; 2023). The lack of professional development reduces faculty engagement and weakens pedagogical innovation (Huang &amp; Wang, 2023; Yang, 2020). This objective investigates how institutional e-learning policies articulate support for faculty training, promote continuous digital skill development, and link these efforts to teaching quality and student engagement. It also identifies gaps between policy intent and faculty experience.</i>
RO5	<i>Technical factors are a cornerstone of adopting e-learning. However, many academic HEIs report inadequate IT systems, insufficient maintenance, and fragmented technical support (He, 2023; MOE, 2023). This objective explores how institutional policies outline operational plans for providing technical assistance, integrating systems, and supporting both faculty and students. It also identifies challenges that hinder the creation of a stable, user-friendly e-learning environment.</i>

## Appendix X

### Issues identified During the Preparatory Phase & Subsequent Modifications

Issues	Modifications
<p>Technical and theoretical terms (e.g., “Education Informatization,” “digital transformation,” “stakeholder engagement,” “institutional logics”) were not easily understood by some faculty or student participants.</p> <p>Participants (especially students and junior faculty) displayed hesitation to critique institutional policies or leadership, consistent with Chinese cultural norms of respect for authority</p> <p>Fear of “saying something wrong” about university management or national initiatives limited openness.</p> <p>Group dynamics in the focus group led to conformity or silence when senior faculty spoke first.</p> <p>Some faculty requested to see the questions in advance, indicating concern about institutional scrutiny.</p> <p>Participants varied widely in digital proficiency; some faculty lacked familiarity with the latest e-learning tools, making discussion abstract or limited.</p> <p>Early focus group transcripts revealed that some questions elicited similar responses (e.g., “support for digital teaching” vs. “training for hybrid learning”).</p> <p>Faculty and administrator schedules were tight; long interviews were impractical.</p> <p>Participants sometimes introduced themes (e.g., Budget Conflicts and Investment Priorities) not covered in the initial guide.</p>	<p>Simplified and localized wording in the interview protocol (e.g., replaced “institutional e-learning strategy” with “school’s e-learning plan” or “policy for online and hybrid learning”).</p> <p>Reframed sensitive questions from direct critique (“Is there any gaps or problems you think are serious when you need technical support for hybrid learning”) to reflective or comparative phrasing (“How do you usually navigate or resolve technical challenges during hybrid instruction?”).</p> <p>Emailing or talking to interviewees later to complement focus group insights, allowing more confidential expression.</p> <p>Clarified anonymity and confidentiality assurances more explicitly at the start of each session.</p> <p>Adjusted question order to begin with neutral, experiential items before moving to policy-level reflections.</p> <p>Added introductory warm-up questions that invited participants to describe their typical use of e-learning tools, bridging experience to policy understanding.</p> <p>Merged overlapping items and reduced the total number of questions to maintain engagement.</p> <p>Limited interviews to 30–45 minutes and offered hybrid options (in-person or online).</p> <p>Updated the guide after each data collection phase to integrate new insights.</p>