A MODEL OF CULTURALLY INSPIRED CHARACTER DESIGN FOR 3D ANIMATION EDUCATION IN CHINA

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Abstrak

Sejak kebelakangan ini, pendidikan animasi tiga-dimensi (3D) telah berkembang secara berterusan bagi membangunkan kemahiran teknikal dan keupayaan kreatif pelajar dalam reka bentuk watak digital serta penceritaan. Walau bagaimanapun, kajian terdahulu menunjukkan bahawa pendidikan animasi sering memberi penekanan kepada penghasilan teknikal, namun kurang memberi perhatian terhadap penerapan inspirasi budaya dalam reka bentuk watak. Hal ini menyebabkan kekurangan reka bentuk watak berinspirasikan budaya dalam pendidikan animasi 3D. Tambahan pula, literatur tentang reka bentuk watak berinspirasikan budaya di China masih terhad dan kekangan model yang komprehensif. Kajian ini bertujuan untuk (i) membangunkan model konseptual bagi menyokong reka bentuk watak berinspirasikan budaya dalam pendidikan animasi 3D di China, (ii) mengesahkan model konseptual tersebut untuk menyokong reka bentuk watak berinspirasikan budaya dalam pendidikan animasi 3D di China, dan (iii) menentukan prestasi model Reka Bentuk Watak Berinspirasikan Budaya 3D (3D-CICD) dari segi kebaharuan, penyelesaian, serta penghuraian dan sintesis watak animasi 3D. Kajian ini menggunakan metodologi penyelidikan kuasi-eksperimen yang melibatkan 60 orang pelajar prasiswazah tahun ketiga. Soal selidik yang berasaskan Skala Semantik Produk Kreatif (CPSS) telah diadaptasi bagi mengesahkan model konseptual 3D-CICD. Seterusnya, ujian-t berpasangan dan ujian-t sampel bebas digunakan untuk mengukur perbezaan prestasi antara ujian pra dan ujian pasca. Dapatan kajian menunjukkan bahawa pelajar yang menggunakan model 3D-CICD menunjukkan prestasi yang jauh lebih baik berbanding mereka yang menggunakan kaedah reka bentuk sedia ada dari segi kebaharuan, penyelesaian, serta penghuraian dan sintesis. Kajian ini seterusnya merumuskan bahawa model 3D-CICD telah meningkatkan keupayaan keseluruhan pelajar dalam reka bentuk watak 3D. Kesimpulannya, dapatan kajian menonjolkan keberkesanan model 3D-CICD dalam meningkatkan prestasi kreatif pelajar, di samping menyediakan panduan yang bernilai kepada animator muda, pendidik, dan pihak berkepentingan yang terlibat dalam pendidikan animasi 3D.

Kata kunci: Pendidikan animasi 3D; Reka bentuk watak; Skala Semantik Produk Kreatif (CPSS); Watak animasi; Watak berinspirasikan budaya

Abstract

In recent years, three-dimensional (3D) animation education has been steadily established to develop students' technical skills and creative abilities in digital character design and storytelling. However, previous studies indicate that animation education often emphasizes technical production while giving limited attention to cultural inspiration in character design. This led to a lack of culturally inspired character design in 3D animation education. Furthermore, the literature on culturally inspired character design in China remains limited and lacks a comprehensive model. This study aims (i) to develop a conceptual model to support culturally inspired character design in 3D animation education in China, (ii) to validate the conceptual model to support culturally inspired character design for 3D animation education in China, and (iii) to determine the performance of 3D-Culturally Inspired Character Design (3D-CICD) model in terms of novelty, resolution, and elaboration and synthesis of 3D animation characters. This study employed a quasi-experimental research methodology with 60 third-year undergraduate students. A questionnaire based on the Creative Product Semantic Scale (CPSS) was adapted to validate the conceptual model of 3D-CICD. Then, a paired and independent-samples t-test were utilised to measure the differences in pre-test and post-test performances. The findings reveal that students who used the 3D-CICD model significantly outperformed those using existing design methods in terms of novelty, resolution, and elaboration and synthesis. It further concludes that the 3D-CICD model has enhanced students' overall 3D character design abilities. In conclusion, the findings highlight the effectiveness of the 3D-CICD model in improving students' creative performance, while offering valuable guidance for young animators, educators, and stakeholders involved in 3D animation education.

Keywords: 3D animation education; Character design; Creative Product Semantic Scale; Animation characters; Culturally inspired characters

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With Gratitude,
Luo Yuye.
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List of Abbreviations

2D	Two Dimensional
3D	Three Dimensional
CICD	Culturally Inspired Character Design
3D-CICD	Culturally Inspired Character Design in 3D Animation
EG	Experimental Group
CG	Control Group
TL	Typical Lesson
CPSS	Creative Product Semantic Scale
CGT	Computer Graphic Technology
TTCT	The Torrance Tests of Creative Thinking
CAT	The Consensual Assessment Technique
TCT-DP	Test of Creative Thinking – Drawing Production
SPSS	Statistical Package for the Social Sciences
CITC	Corrected Item-Total Correlation
KMO	Kaiser-Meyer-Olkin
CSSCI	Chinese Social Sciences Citation Index
IP	Intellectual Property
IMDB	Internet Movie Database

CHAPTER ONE
INTRODUCTION

1.1 Introduction

This chapter begins with an overview of the study's background. It then presents the problem statement. Based on this, the research objectives and questions are formulated. Next, the research scope and significance of the study, and definitions of the terms of the research are outlined. The chapter concludes by explaining the organization of the thesis and providing a summary.

1.2 Background of the Study

Tillman (2011) emphasizes that the definition of character design in three-dimensional (3D) animation is to simulate or create living organisms that exist or do not exist in reality through different forms of expression, such as realism, abstraction, etc. The character is a character or an animal, and the modeling is created according to the thematic content of 3D animation, which pays more attention to the proportions of the character's body, body language, and facial expression, and gives the modelling and soul in line with the theme of the character; and rigorously and realistically sets the character's strictly and realistically set the constants of the character's movement, form, action and other elements, to make it a living organism (Tillman, 2011).

Erlhoff & Marshall (2007) discuss the term "character design" is commonly applied in various contexts, including animated films, comics, and games, where one or more fictional characters are intended to engage with the audience. Character design involves determining a character's physical appearance and incorporates processes

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Appendix A

Expert Review Form:

Conceptual Model of Culturally Inspired Character Design for 3D Animation Education in China

Abstract:

This study proposes a conceptual model for culturally inspired character design in 3D animation (3D-CICD). The conceptual model integrates cultural inspiration and practical design processes to enhance the 3D character design in China. This expert review aims to assess the model's reliability, clarity, and applicability to ensure its validity as a reference for educators and researchers, animation designers, and students.

Objective of Expert Review:

To review the proposed conceptual model for culturally inspired character design in 3D Animation (3D-CICD) and assess its clarity and feasibility in guiding culturally inspired character design.

Please note that all information provided will be used exclusively for this study. The confidentiality of your responses is assured and will only be utilized to support the research framework and instruments.

Investigator: Luo Yuye

Supervisor: Prof. Madya Dr. Juliana Aida Abu Bakar & Dr. Mohd Fitri Yusoff

Universiti Utara Malaysia (UUM)

Tel: 086-15591881810; Email: max_luo@foxmail.com | maxxx1969ye@gmail.com

***Please complete this research form on the next sheet.

Expert/Reviewer Details

Name: _____

Age: _____

Gender: _____

Email: _____

Affiliation/Institution: _____

Field of Expertise: _____

Terminology of Key Components

a) **Problem Definition:** The initial phase where cultural backstory, myths, legends, historical figures, arts, and values are identified to inspire character creation.

b) **Research:** The investigation of cultural elements and accessories that contribute to a character's authenticity.

c) **Ideation:** The creative process where visual design (silhouette, dynamic line, color, shape) and personality (external features, inner character) are developed.

d) **Refinement:** The stage of refining and finalizing the design before production.

e) **Product:** The final culturally inspired 3D character design.

Proposed Conceptual Model of 3D-CICD

Items for Review

Based on the proposed conceptual model (as depicted in the given handout), please tick your choice.

1. The clarity of terminology

Criteria	Needs detailed explanation	Needs some clarification	Easy to understand	Comments
Problem Definition				
Research				
Ideation				
Refinement				
Product				

2. The proposed components in the conceptual model are relevant

Criteria		Some are definitely not relevant	Some may not be relevant	All are relevant	Comments
Backstory	Traditional myths and legends				
	Historical figures and events				
	Traditional arts and crafts				
	Cultural Values				
	Personality and mind culture				
	Time				
Cultural Elements	Accessories				
Visual Design	Silhouette				
	Dynamic Line				
	Color				
	Shape				
Personality	External Feature				
	Inner Character				

Implementation	Modeling,				
	Texturing				
	Rigging				
	Animating				

3. The structure and logical connections between components are clear

Criteria	Needs major revision	Needs minor improvement	Clearly structured	Comments
Flow from Problem Definition to Product				
Integration of Cultural Elements				
Transition between Ideation, Refinement, and Implementation				

4. The connections of all the theories and components are logical.

Criteria	Some are definitely not logical	Some may not be logical	All are logical	Comments
Theories and components				

5. The conceptual model provides useful guidance for integrating cultural elements in 3D character design.

Criteria	Some are definitely not useful	Some may be useful	Useful guidance	Comments
Guidance				

6. Overall, the conceptual model is easy to interpret and use.

Criteria	Some are definitely not easy to interpret and use	Some may be easy to interpret and use	Easy to interpret and use	Comments
Conceptual model				

7. Additional Comments:

Thank you for your time and valuable feedback!

Confidentiality: All data and information gathered will remain strictly private and confidential.

By signing below, I confirm that I have read and understood the above content, and I agree to participate in this study as an expert reviewer.

Expert's signature /stamp

Appendix B

Informed Consent Letter for Expert

Before agreeing to participate in this study, experts are advised to read and understand the following procedures:

Title of Study: Conceptual Model of Culturally Inspired Character Design for 3D Animation Education in China

Purpose of the Study: This study aims to develop and validate a conceptual model for culturally inspired character design for 3D animation education in China. The conceptual model integrates cultural elements, visual design principles, and character development strategies to ensure that character designs reflect Chinese cultural identity while meeting modern animation education standards. Expert validation is essential to assess the reliability, practical applicability of this model.

Procedures:

1. Experts will review and validate the conceptual model, ensuring its theoretical soundness and applicability to 3D animation education.

2. Experts will assess the framework's logical structure, including its key components: preparative (problem definition and research), generative (ideation and refinement), and implementation stages.

3. Experts will evaluate the integration of cultural elements (e.g., traditional myths, historical figures, cultural values) into the character design process.

4. Experts will examine the relationship between visual design attributes (e.g., silhouette, dynamic lines, color, shape) and the character's cultural identity and audience engagement.

5. Experts will provide feedback on the clarity, usability, and adaptability of the model for animation students, animation designers, educators, and practitioners in the industry.

Confidentiality: All data and information gathered will remain strictly private and confidential.

By signing below, I confirm that I have read and understood the above content, and I agree to participate in this study as an expert reviewer.

Expert's signature /stamp

Appendix C

Informed Consent Letter for Participant

Title of Study: Conceptual Model of Culturally Inspired Character Design for 3D Animation Education in China

Purpose of the Study: This study aims to evaluate the 3D-CICD (Culturally Inspired Character Design) Conceptual Model in improving students' creativity and ability to integrate cultural elements into 3D animation character design. The results will contribute to the development of innovative teaching models for 3D animation education in China.

Procedures:

1. You will participate in a four-week instructional program as part of your animation character design course.

2. During the study, you will attend classes, complete design exercises, and create a 3D animation character according to the course requirements.

3. You will be asked to complete a pre-test and post-test using the Creative Product Semantic Scale (CPSS) to measure changes in your creative performance.

4. Participation will not affect your academic grade. Your involvement is voluntary and purely for research purposes.

Confidentiality: All information collected in this study will be kept strictly confidential. Your name and identity will not appear in any report or publication. Data will be used only for academic research and will be securely stored by the researcher.

Voluntary Participation: Your participation in this study is entirely voluntary. You have the right to withdraw from the study at any time without penalty or negative consequences.

Benefits: By participating, you will gain a deeper understanding of 3D animation character design and learn how to incorporate Chinese cultural elements creatively in your work

Risks: There are no foreseeable risks associated with participating in this study.

Contact Information: If you have any questions about this research, you may contact:
Researcher: Luo Yuye

Supervisor: Prof. Madya Dr. Juliana Aida Abu Bakar & Dr. Mohd Fitri Yusoff

Universiti Utara Malaysia (UUM)

Tel: 086-15591881810; Email: max_luo@foxmail.com | maxxx1969ye@gmail.com

Consent Statement:

By signing below, I confirm that I have read and understood the above content, and I agree to participate in this study as an expert reviewer.

Participant's signature /stamp

Appendix D

Questionnaire for Creative Product Semantic Scale（CPSS）

Conceptual Model of 3D-CICD Assessment Guide for Experts

The purpose of this questionnaire is to assess students' performance in incorporating cultural elements, design creativity, and overall design level in 3D character design before and after using the Conceptual Model for Culturally Inspired Character Design (3D-CICD). The research questionnaire was developed based on the Creative Product Semantic Scale (CPSS) scale and incorporates the characteristics of cultural heritage and creative expression in 3D character design.

The main goal of this study is to assess the 3D-CICD conceptual models in character design through pre-tests and post-tests of students' work. Feedback from experts will help us to verify the improvements in cultural awareness, emotional resonance, and design creativity of students using the model, and provide a reference basis for teaching 3D character design.

Respondents' data will not be retrieved if they stop answering or answer only part of the questionnaire. In addition, respondents will not be allowed to record any part of this research question without the authorization of the investigator.

It is hoped that Professor/Doctor/Mr/Ms/Mrs/Encik/Cik will answer the questions of this study honestly and completely. All information provided is strictly confidential and will be used only for the purpose of this study.

I am honored and grateful to you for taking the time (5 - 10 minutes) to answer this research questionnaire. Your co-operation is greatly appreciated.

Investigator: Luo Yuye

Supervisor: Prof. Madya Dr. Juliana Aida Abu Bakar & Dr. Mohd Fitri Yusoff

Universiti Utara Malaysia (UUM)

Tel: 086-15591881810; Email: max_luo@foxmail.com | maxxx1969ye@gmail.com

***Please complete this research form on the next sheet.

Questionnaire

Introduction:

1. Thank you for agreeing to participate in the testing.
2. Please note that any information provided is difficult and for research purposes.
3. Any questions should be asked during this session.

Part 1: Novelty

Please circle your response according to the following scale Strongly Disagree (1) <----------..> Strongly agree (7)								
1	The student's character design is more original and distinctive than previous designs	1	2	3	4	5	6	7
2	The student's character design is able to break away from traditional design conventions and show unique creativity	1	2	3	4	5	6	7
3	The student's character design is aesthetically and stylistically unconventional, with unconventional design ideas.	1	2	3	4	5	6	7
4	The student's character design is visually recognisable and significantly different from other designs.	1	2	3	4	5	6	7
5	The student's character design makes the audience feel a strong sense of originality and creativity through novel elements.	1	2	3	4	5	6	7

Part 2: Resolution

Please circle your response according to the following scale Strongly Disagree (1) <----------..> Strongly agree (7)								
1	The student's character design can effectively communicate the values and meanings of traditional Chinese culture.	1	2	3	4	5	6	7
2	The student's character design reflects the importance of traditional Chinese culture in design.	1	2	3	4	5	6	7
3	The students' character design is able to convey cultural context while reflecting its importance and depth.	1	2	3	4	5	6	7
4	The student's character design demonstrates cultural heritage and cultural values and effectively enhances the audience's understanding of culture.	1	2	3	4	5	6	7
5	The student's character design is not only visually appealing effectively communicates its functional and cultural significance.	1	2	3	4	5	6	7

Part 3: Elaboration and Synthesis

Please circle your response according to the following scale Strongly Disagree (1) <----------..> Strongly agree (7)								
1	The student's character design clearly conveys the connotations of traditional Chinese culture.	1	2	3	4	5	6	7

2	The student's character design is able to accurately demonstrate the elements and symbolism of traditional Chinese culture.	1	2	3	4	5	6	7
3	The student's character design enables the audience to easily understand and recognise the traditional Chinese cultural elements involved.	1	2	3	4	5	6	7
4	The student's character design conveys the stories, values, and beliefs of traditional Chinese culture in a way that is easy for the audience to understand.	1	2	3	4	5	6	7
5	The student's character design visually conveys traditional Chinese culture so that the viewer understands the underlying cultural significance without additional explanation.	1	2	3	4	5	6	7

Confidentiality: All data and information gathered will remain strictly private and confidential.

By signing below, I confirm that I have read and understood the above content, and I agree to participate in this study as an expert reviewer.

Expert's signature /stamp

Appendix E

Sample of Student Outcome and its Evaluation by Experts

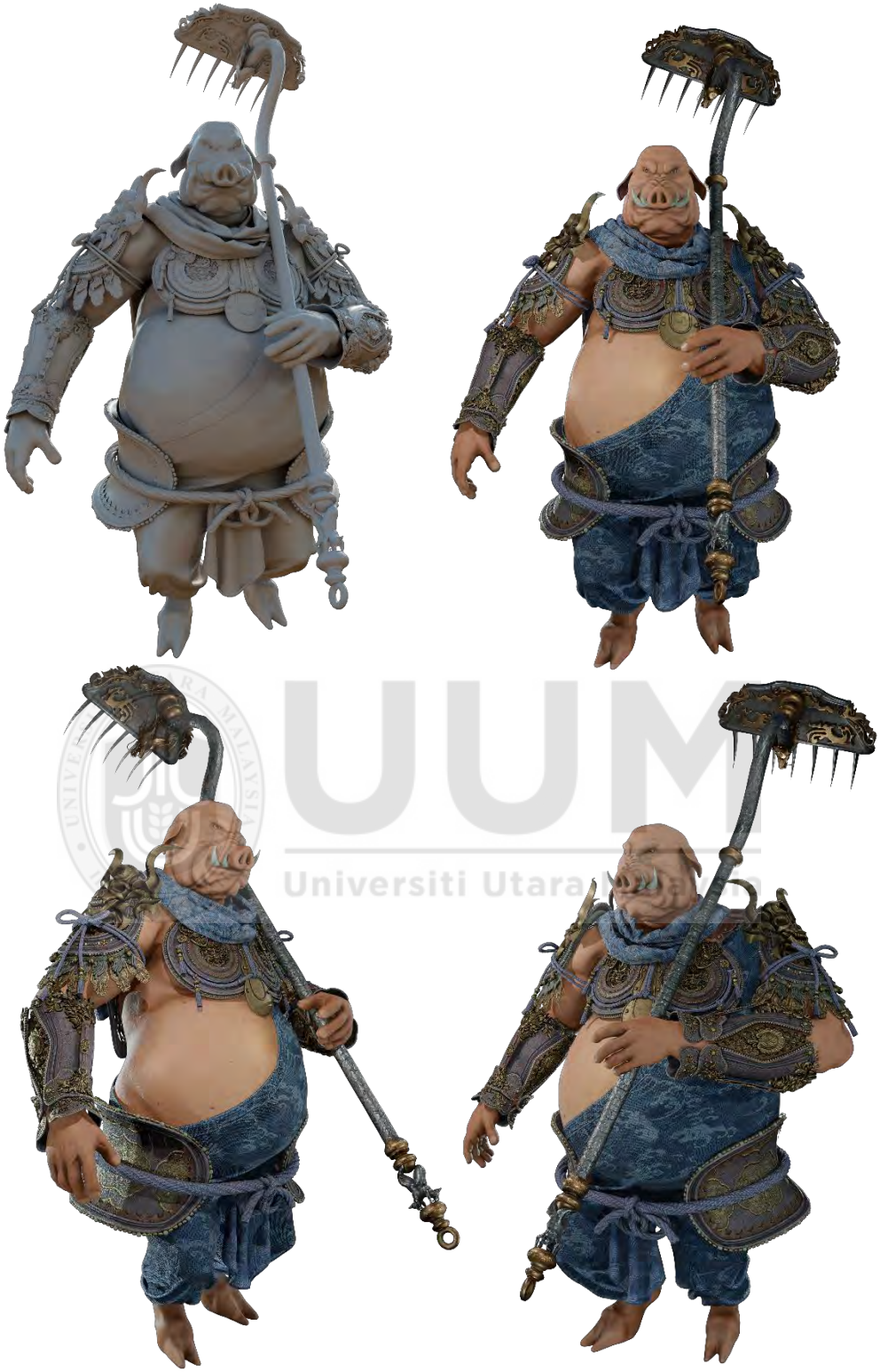
Sample of Student Outcome

Student Code: EG-4

Group: Experimental Group (Using the 3D-CICD Conceptual Model)

Procedures:

This 3D character design reinterprets Zhu Bajie, one of the classical figures from Journey to the West, integrating traditional Chinese mythology with modern 3D animation aesthetics. The design emphasizes cultural elements through costume details inspired by Ming dynasty armor and textile patterns. The intricate metal ornaments and embroidered fabric textures reflect craftsmanship and spiritual connotation, while the exaggerated proportions and humorous facial expression preserve the character's original personality traits of laziness and kindness. Technically, the work demonstrates advanced modeling, texturing, and material rendering, showcasing a balance between cultural authenticity and contemporary design innovation.



Student EG-3 final 3D Character Design

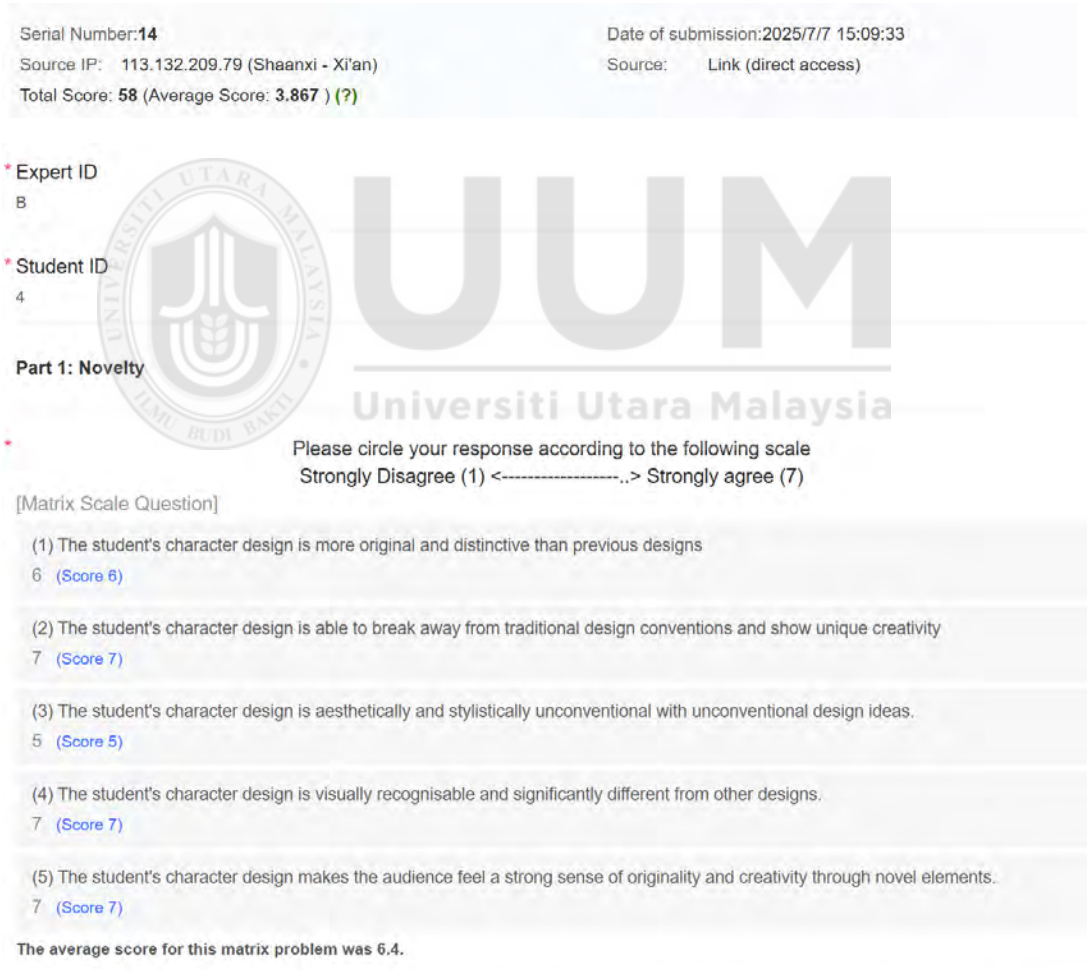
Evaluation by Experts

Expert Code: B

Evaluation Instrument: Creative Product Semantic Scale (CPSS) (Adapted Version, see Appendix D)

Date of Evaluation: July 7, 2025

Evaluation Platform: Wenjuanxing (Questionnaire Star Online System)



Serial Number:**14**
Date of submission:2025/7/7 15:09:33
Source IP: 113.132.209.79 (Shaanxi - Xi'an)
Source: Link (direct access)
Total Score: **58** (Average Score: **3.867**) **(?)**

* Expert ID
B

* Student ID
4

Part 1: Novelty

*
Please circle your response according to the following scale
Strongly Disagree (1) <----------..> Strongly agree (7)

[Matrix Scale Question]

(1) The student's character design is more original and distinctive than previous designs
6 (Score 6)

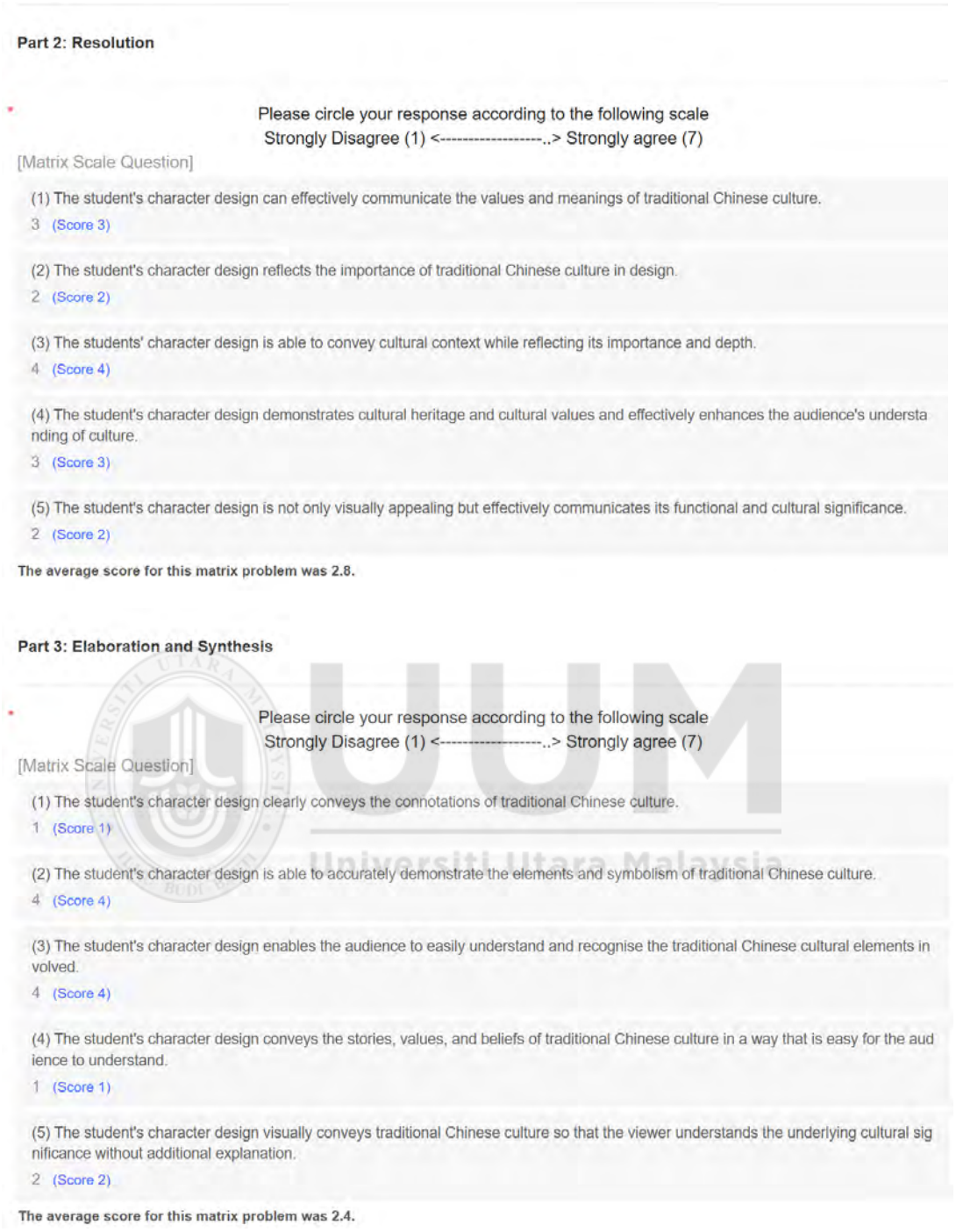
(2) The student's character design is able to break away from traditional design conventions and show unique creativity
7 (Score 7)

(3) The student's character design is aesthetically and stylistically unconventional with unconventional design ideas.
5 (Score 5)

(4) The student's character design is visually recognisable and significantly different from other designs.
7 (Score 7)

(5) The student's character design makes the audience feel a strong sense of originality and creativity through novel elements.
7 (Score 7)

The average score for this matrix problem was 6.4.



Part 2: Resolution

Please circle your response according to the following scale
Strongly Disagree (1) <----------..> Strongly agree (7)

[Matrix Scale Question]

(1) The student's character design can effectively communicate the values and meanings of traditional Chinese culture.
3 (Score 3)

(2) The student's character design reflects the importance of traditional Chinese culture in design.
2 (Score 2)

(3) The students' character design is able to convey cultural context while reflecting its importance and depth.
4 (Score 4)

(4) The student's character design demonstrates cultural heritage and cultural values and effectively enhances the audience's understa nding of culture.
3 (Score 3)

(5) The student's character design is not only visually appealing but effectively communicates its functional and cultural significance.
2 (Score 2)

The average score for this matrix problem was 2.8.

Part 3: Elaboration and Synthesis

Please circle your response according to the following scale
Strongly Disagree (1) <----------..> Strongly agree (7)

[Matrix Scale Question]

(1) The student's character design clearly conveys the connotations of traditional Chinese culture.
1 (Score 1)

(2) The student's character design is able to accurately demonstrate the elements and symbolism of traditional Chinese culture.
4 (Score 4)

(3) The student's character design enables the audience to easily understand and recognise the traditional Chinese cultural elements in volved.
4 (Score 4)

(4) The student's character design conveys the stories, values, and beliefs of traditional Chinese culture in a way that is easy for the aud ience to understand.
1 (Score 1)

(5) The student's character design visually conveys traditional Chinese culture so that the viewer understands the underlying cultural sig nificance without additional explanation.
2 (Score 2)

The average score for this matrix problem was 2.4.

Source: Data collected through Wenjuanxing (Questionnaire Star) online evaluation system.

Appendix F

Data Collection Permission Letter

AWANG HAD SALLEH
GRADUATE SCHOOL OF ARTS AND SCIENCES
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Universiti Utara Malaysia
06010 UUM SINTOK
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Email : ahsgsservices@uum.edu.my

Our Ref. : UUM/CAS/AHSGS/ 905541
Date : 27 April 2025

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	:	**Luo, Yuye**
Matric No.	:	**905541**
Course	:	**Doctor of Philosophy (Creative Multimedia Industry Management)**
Thesis Title	:	**Conceptual Model Of Culturally Inspired Character Design For 3d Animation Indutry In China**

To learn more about the research for the project paper or thesis, kindly contact the supervisor, Prof. Madya Ts. Dr. Juliana Aida binti Abu Bakar, at 019-4585856 by email at liana@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

ZOR BIN MAT NOR
Senior Assistant Registrar
p.p. Dean