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**STUDY ON EMPLOYEE ENGAGEMENT
AMONG ENGINEERS IN SELECTED MALAYSIAN MEDICAL DEVICE
MANUFACTURING COMPANIES**



By

LIDIA STEPHEN

**Thesis Submitted to
College of Business
University Utara Malaysia,
in Partial Fulfilment of the Requirement for Master of Science (Management)**



**Pusat Pengajian Pengurusan
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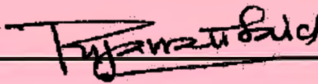
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ABSTRACT

This thesis explores the relationship between independent variables such as leadership, training and development, compensation, and work environment, and employee engagement among engineers in selected Malaysian medical device manufacturing companies. The study uses a quantitative approach to test the hypotheses using data collected from 174 engineers. The results of the study indicate that there is a significant relationship between leadership and employee engagement, training and development and employee engagement, compensation and employee engagement, and work environment and employee engagement. The study highlights the importance of these independent variables in promoting employee engagement in the medical device manufacturing industry. The findings of this study have significant implications for industry practitioners and policymakers, particularly in the area of human resource management. This study contributes to the existing literature on employee engagement by providing empirical evidence from the medical device manufacturing industry in Malaysia.

Keywords : *Employee engagement, leadership, training and career development, compensation, work environment*



ABSTRAK

Tesis ini meneroka hubungan antara pemboleh ubah bebas seperti kepimpinan, latihan dan pembangunan, pampasan, dan persekitaran kerja, dan penglibatan pekerja di kalangan jurutera dalam syarikat pembuatan alat perubatan terpilih di Malaysia. Kajian menggunakan pendekatan kuantitatif untuk menguji hipotesis menggunakan data yang dikumpulkan daripada 174 jurutera. Keputusan kajian menunjukkan bahawa terdapat hubungan yang signifikan antara kepimpinan dan penglibatan pekerja, latihan dan pembangunan dan penglibatan pekerja, pampasan dan penglibatan pekerja, serta persekitaran kerja dan penglibatan pekerja. Kajian ini menekankan kepentingan pemboleh ubah bebas ini dalam mempromosikan penglibatan pekerja dalam industri pembuatan alat perubatan. Penemuan kajian ini mempunyai implikasi yang signifikan untuk amalan industri dan pembuat dasar, terutamanya dalam bidang pengurusan sumber manusia. Kajian ini menyumbang kepada literatur sedia ada tentang penglibatan pekerja dengan memberikan bukti empirikal daripada industri pembuatan alat perubatan di Malaysia.

Kata kunci: *Keterlibatan pekerja, kepimpinan, latihan dan pembangunan kerjaya, pampasan, persekitaran kerja.*



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LIST OF ABBREVIATION

SET	Social Exchange Theory
SPSS	Statistic package for Social Science
EE	Employee Engagement
LD	Leadership
TCD	Training & Career Development
WE	Work Environment



CHAPTER 1

INTRODUCTION

1.1. Introduction

This chapter serves as an introduction to the research project, providing an overview of the study's working title and drawing upon relevant academic literature. It outlines the purpose of the investigation, which informed the establishment of research goals, hypotheses, and independent and dependent variables. Furthermore, the chapter presents a series of research topics that are linked to the study's conclusions. The problem statement, which shaped the study's findings, is derived from the analysis presented in this chapter. In summary, the chapter describes the study's background, problem statement, research objectives, questions, and hypotheses, along with the significance of the research and the definitions of key terms. It also identifies the intended audience for the research and previews the expected findings.

1.2. Background of study

The term "employee engagement" refers to a multi-faceted motivating idea that depicts an individual's feelings, intellect, physical energy, and high performance (Kuok and Taormina, 2017). Ruck et al. (2017) acknowledged that employee engagement is one of the significant aspects that contribute to the effectiveness, competitiveness, and creativity of a business. The increase in employee engagement that results from increased work satisfaction is one of the primary ways in which manufacturers boost their overall productivity (Moletsane et al., 2019). The concepts of employee

commitment, employee happiness, and employee motivation are not synonymous with engagement (Mone & London, 2018). In point of fact, it takes things a step further by describing the emotional connection that workers have with their work, which motivates them to perform at the best level of their abilities and to be more focused on the outcomes of their efforts.

The importance placed on ensuring that workers are actively engaged in their jobs has grown substantially in recent years, both in the academic world and the business world. According to Singh and Gupta (2015), one of the most critical problems for firms is to successfully engage skilled workforces. According to a research that was published by Harter (2018), employee engagement is a crucial factor in determining employee well-being, productivity, and profitability. In addition, engaged workers might have a positive or negative impact on the bottom line of the firm. A significant link between employee engagement and positive organisational outcomes such as increased job satisfaction, increased customer satisfaction, increased organisational commitment, increased employee retention, increased productivity, increased financial performance, increased organisational citizenship behaviour, decreased employee burnout, and decreased employee intention to leave has been found in a number of research studies (Saks, 2019).

The medical device sector is very varied and plays a critical position in the overall health care system of a nation, notably in the diagnosis, prevention, and treatment of a wide range of disorders. There are now approximately 10,000 different kinds of medical devices, some examples of which include surgical tools, hospital furnishings, therapeutic equipment such as prosthetic and orthotic fitments, hearing aids, and

medical imaging systems. According to Čiarnienė and Vienažindienė (2013), in the current context of manufacturing, businesses are working hard to maintain their position as market leaders. Competition amongst manufacturing institutions is being fuelled by the fact that manufacturing organisations are being challenged by an increasing amount of demand from consumers who seek greater quality, delivery time, and decreased cost.

Medical Device Manufacturing (MDM) refers to the process of designing, developing, and producing medical devices, such as surgical instruments, diagnostic equipment, implants, and prosthetics, for use in healthcare. MDM involves a range of activities, including research and development, prototyping, testing, regulatory compliance, and quality assurance. This is done in order for these companies to thrive in an industry that is both highly competitive and highly regulated. Medical device manufacturing is the process of designing, developing, and producing medical devices such as surgical instruments, diagnostic equipment, implants, and prosthetics for use in healthcare. It involves various stages, including research and development, prototyping, testing, regulatory compliance, and quality assurance. Medical device manufacturers must comply with strict regulations and standards to ensure the safety and efficacy of their products.

The Medical Device Authority (MDA) in Malaysia is a regulatory body under the Ministry of Health (MOH) responsible for overseeing the registration, post-market surveillance, and regulation of medical devices in the country. It was established in 2012 under the Medical Device Act 2012 and is part of the MOH's efforts to strengthen the regulatory framework for medical devices in Malaysia. The MDA's main functions

include implementing and enforcing regulations and standards for medical devices, managing the registration and listing of medical devices, conducting post-market surveillance activities, and ensuring compliance with safety and performance requirements. The MDA also provides guidance to stakeholders in the medical device industry to help them meet regulatory requirements and improve patient safety. Overall, the MDA plays an essential role in ensuring the safety and efficacy of medical devices in Malaysia and protecting the health of the public.

In Malaysia, the classification system is designed to ensure that medical devices are regulated according to their potential risks and the extent of control necessary to ensure their safety and performance. Class A medical devices are considered low risk and are subject to general regulatory controls, while Class B devices have a moderate level of risk and require conformity assessment with specific standards. Class C and D medical devices are considered high risk and require more stringent regulatory controls and conformity assessment. The classification of a medical device in Malaysia is based on factors such as the intended use, duration of use, invasiveness, and contact with the body. Medical device manufacturers must comply with the relevant regulatory requirements and standards based on the classification of their devices. The examples that have been provided are just meant to serve as an instance; the manufacturer is the one who is responsible for applying the categorization criteria to each medical device in accordance with its intended use.

1.3. Problem Statement

Malaysia's medical device manufacturing industry has seen steady growth in recent years. As of 2021, the industry is estimated to be worth RM13 billion, and it is

projected to grow at a compound annual growth rate of 6.3% from 2021 to 2026. However, despite this growth, the industry faces various challenges that impede its full potential, affecting the overall productivity and competitiveness of Malaysian medical device manufacturers.

One of the major challenges faced by medical device manufacturing companies in Malaysia is the lack of skilled labour and high employee turnover rates. This is due to the limited availability of training and career development programs, which are essential for developing a skilled and motivated workforce. In addition, the work environment in many medical device manufacturing companies is often overlooked, leading to a decrease in employee engagement and productivity.

Moreover, compensation policies in many medical device manufacturing companies in Malaysia are not aligned with industry standards, resulting in difficulty attracting and retaining top talent. The combination of these factors has a significant impact on the success and sustainability of medical device manufacturing companies in Malaysia.

The research conducted by Saks (2019), which demonstrates that the perceived support that an organisation and its leaders provide to workers is a significant factor in determining engagement levels, is an excellent illustration of this concept. There is substantial evidence to demonstrate that the activities of management have a favourable impact on the behaviour of workers in hospitality organisations (Malek et al., 2018).

Gruman and Saks (2011) suggest that "training is particularly significant for providing workers with tools that enable them feel available to fully participate in their positions." This is based on Kahn's (1990) psychological conditions. Training and development programs have been found to have a positive impact on employee engagement, with studies showing that employees who receive training and development opportunities are more engaged than those who do not. This is particularly true for programs that are engineered for employees and the organization and that allow for continuous learning and development (Kreutzer, Leonard, & Beauregard, 2019).

Compensation can also impact employee engagement by supplying employees with a sense of financial security and stability, which can reduce stress and anxiety and increase their overall well-being (Huang & Cheng, 2018). This is particularly important in today's uncertain economic climate, where employees may be concerned about job security and financial stability. It is further clarified that companies are obligated to pay employees for any work that is done by them, regardless of whether the compensation is in the form of physical or intangible incentives. Additionally, employers have an obligation to offer workers with opportunities for advancement and promotion. Employees have the potential to better themselves so that they are more productive and efficient, as well as more involved with their work and the business overall when they are provided this opportunity.

Anitha (2014) claims that there is a considerable association within the work environment and the level of employee engagement. When considering whether or not to continue working for an organisation, workers give significant weight to the

conditions of their working environment. The presence of a secure working environment might encourage more potential employees to submit their resumes for consideration for open jobs in the company. People want to work in an atmosphere that is secure, thus the working conditions play a significant part in this.

1.4. Research Questions

The purpose of this study was to examine how the independent variables - leadership, compensation, work environment, and training and development - are related to the dependent variable, which is employee engagement. The study aimed to answer the following research questions:

- 
- i. Does leadership have significant relationship with employee engagement among engineers in selected Malaysian medical device manufacturing companies ?
 - ii. Does training and career development have significant relationship with employee engagement among engineers in selected Malaysian medical device manufacturing companies ?
 - iii. Does compensation have significant relationship with employee engagement among engineers in selected Malaysian medical device manufacturing companies?
 - iv. Does work environment have significant relationship with employee engagement among engineers in selected Malaysian medical device manufacturing companies?

- v. Does leadership, training and development, compensation, and work environment has effect on employee engagement among engineers in selected Malaysian medical device manufacturing companies?

1.5. Research Objective

The purpose of this research is to provide answers to the following questions in an effort to bridge the knowledge gap and make further contributions to the existing body of literature:

- i. To investigate the relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies.
- ii. To investigate the relationship between training and career development and employee engagement among engineers in selected Malaysian medical device manufacturing companies.
- iii. To investigate the relationship between compensation and employee engagement among engineers in selected Malaysian medical device manufacturing companies.
- iv. To investigate the relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

- v. To investigate if there is an effect of leadership, training and development, compensation, and work environment on employee engagement among engineers in selected Malaysian medical device manufacturing companies.

1.6. Scope of Research

This research is examine the factors that influence employee engagement among engineer in selected Malaysian Medical Device manufacturing companies. The research of study completed by utilising quantitative methodologies and data analysis was analysed by using SPSS software.

1.7. Significance of Research

The research on employee engagement in the medical device manufacturing industry is significant for several reasons. First, employee engagement is a essential factor for success in this industry, which requires highly skilled engineers and a culture of innovation. Understanding what drives employee engagement can help companies to create a more engaged and productive workforce, which can have a positive impact on their bottom line.

Second, the research has identified specific factors, such as leadership, compensation training, and career development, and work environment that are significant in driving employee engagement in this industry. This knowledge can help organizations to identify areas where they can improve and develop strategies for increasing employee engagement.

Third, the research can help to guide organizational decision-making and investment in programs and initiatives that support employee engagement. By providing evidence-

based insights, organizations can make more informed decisions about how to allocate resources to achieve their goals.

Overall, the study on employee engagement in the medical device manufacturing industry is significant because it can help organizations to create a culture of engagement that supports their employees and drives innovation and growth. By investing in their employees and creating a positive work environment, organizations can improve their competitiveness and achieve their strategic objectives.

Besides, this study provided data for future research in the area of producing medical devices. The results of study contributes to body of research on determinants towards employee engagement level. In addition, the results ideally gave beneficial counsel, information and references for the other researcher who took on additional investigations on relevant themes. Last but not the least, the outcomes of the research not only expanded knowledge but also shed some light on the connection and impact of the engagement of employee notably within Malaysia.

1.8. Definition of Key Terms

The meanings the important concepts used in this investigation are provided below :

Employee Engagement

In recent years, organizations have increasingly prioritized employee engagement due to its positive impact on employee productivity, job satisfaction, and retention rates, as supported by research (Kahn, 1990; Saks, 2006). Typically, employee engagement is defined as the level of emotional attachment an employee has towards the

organization and its objectives, as well as their initiative to exert effort and go beyond their job requirements to help the organization (Shuck & Reio, 2014).

Leadership

According to Kesting et al. (2016), leadership may be defined as the process through which a person motivates or influences others to attain the objectives of an organisation. It is the process of elevating and supporting the workers' levels of self-esteem and motivation in order for them to accomplish the objectives and goals set by the business. The leader, as well as the leadership style and abilities that the leader has, plays a significant role in the motivation of workers.

Training and Career Development

Training and development is described as the process of methodically building work-related knowledge and competence in individuals with the objective of enhancing performance, as stated by Swanson and Holton (2001). According to Noe (2017), effective training and career development programs should be designed to meet the needs of both the organization and the individual employee.

Compensation

Compensation is a critical area of focus for organizations as it plays a significant role in attracting and retaining top talent. Compensation can be defined as the total rewards, including salary, benefits, and other forms of compensation, that an employee receives in exchange for their work (Milkovich & Newman, 2017).

Work Environment

According to Yusuf and Metiboba (2012), a working environment is made up of three primary sub environments: the technological environment, the human environment, and the organisational environment. These three components make up the overall workplace environment. According to them, the term "technical environment" refers to the workplace's tools, equipment, technological infrastructure, and any other technical or physical components that make up the space.

1.9. Organization of Research

The first chapter, the introduction, provides an overview of the research project, including the background, problem statement, research objectives, questions, and hypotheses, along with the significance of the research and the definitions of key terms. The second chapter, the literature review, involves a critical analysis of existing literature on the research topic, demonstrating the gap in knowledge and identifying the research questions and objectives. The third chapter, the methodology, outlines the research design, methods, and techniques used in the study, including the population and sample, data collection and analysis procedures, and research instrument used. The fourth chapter, the results, presents the data and findings of the research, including charts, graphs, tables, and statistics to illustrate the research outcomes. Finally, the fifth chapter, the discussion and conclusion, provides a summary of the research findings and the implications for the research questions and hypotheses, along with the limitations of the study and recommendations for future research. The overall organization of a research project aims to provide a clear and logical flow of information for the reader, presenting the background, research questions, methodology, results, and conclusions in a coherent and concise manner.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

The review of previous research that is relevant to this topic kicked off the next part. In the beginning, the chapter presents an analysis of the idea of the dependent variable known as employee engagement. Following that, talks were offered in regard to the idea of leadership, training and career development, remuneration and work environment as the independent variables, followed by underlying theory, the research design, and finally an explanation of previous studies.

2.2. Employee Engagement

One definition of employee engagement is that it is "the tying of the members of an organisation to the work tasks that have been given to them." (Chung, Cooke, Fry, & Hung, 2015). This is accomplished through the individual's ability, while working, to express oneself in a variety of various ways, including emotionally, physically, and intellectually. Engagement on the part of workers is impossible unless the organisational practises in question are favourable to those workers. The persistent, positive affective-cognitive aspect of fulfilment in workers, characterised by energy, determination, and absorption, is one definition of employee engagement (Biswas & Bhatnagar, 2013). It refers to the feelings of ardour and excitement that workers have for the task that they do (Aryee, et al., 2016).

The word "engagement" is often used in common parlance to mean "involvement," "passion," "enthusiasm," and "energy." In addition, practitioners often characterise employee engagement in terms of emotional commitment, satisfaction, and identification. This "puts old wine in new bottles" and muddles the meaning of many notions (Schaufeli & Bakker, 2010). For instance, one of the pieces of practitioner literature that is cited the most frequently is the framework developed by Harter, Schmidt, and Hayes (2002).

In spite of the large number of definitions, Segalla and DeNisi (2019) found that none of them contributed to a clearer understanding of what engagement means. Additional study into the different definitions was carried out in order to acquire a better understanding factors that contributes employee engagement in the workplace. Despite the fact that there are forty different definitions of engagement in the workplace, the phrase "workplace engagement" was used in this research as a generic term for participation in the workplace.

Many different points of view have been explored in studies on engagement. Kumar and Pansari (2016) centred their research on the dynamic that exists between staff members and clientele. As a result, they describe customer engagement as the attitude, behaviour, and the amount of connectivity among consumers, between customers and workers, and of customers and employees inside an organisation. They made the observation that rising levels of positive attitude and conduct generated an atmosphere that was favourable to higher degrees of connectivity and involvement. They proceeded to broaden their definition by using this angle as a starting point. As a second component of engagement, there was some thought given to conducting a more

in-depth investigation of the manner in which workers interact with clients, as well as their mentality and actions in regard to the organisation

According to Oktanofa, Arliawan, and Gustomo (2022), the work that Gallup does on employee engagement is founded on more than 30 years' worth of extensive behavioural economic research that has included more than 17 million workers. Gallup has conducted extensive study and come up with 12 fundamental components that they refer to as "The Q12" that have a direct relationship to important business results. The Q12 Employee Engagement Measuring Tool from Gallup is Designed to Initiate Transformation Across the Entire Company in Order to Produce Sustainable Growth. This instrument has extensive scientific backing that connects it to nine different essential performance outcomes. These 12 statements were shown to be the strongest medium of employee and workgroup success after extensive research.

2.3. Independent Variables

In a research study conducted by Anitha with small firms in India, lower-level and middle-level managers were surveyed to identify factors contributing to successful employee engagement. Anitha's findings suggest that there are seven key factors that play a role in promoting employee engagement, which include the working environment, leadership, interpersonal relationships, opportunities for learning and career growth, pay, company policies, and employee well-being. Anitha recommends that leaders understand the significance of these processes in fostering employee engagement and take measures to ensure their implementation.

Anitha (2014) also developed a validated model, as illustrated in Figure 2.1, to assess the impact of employee engagement on employee performance.

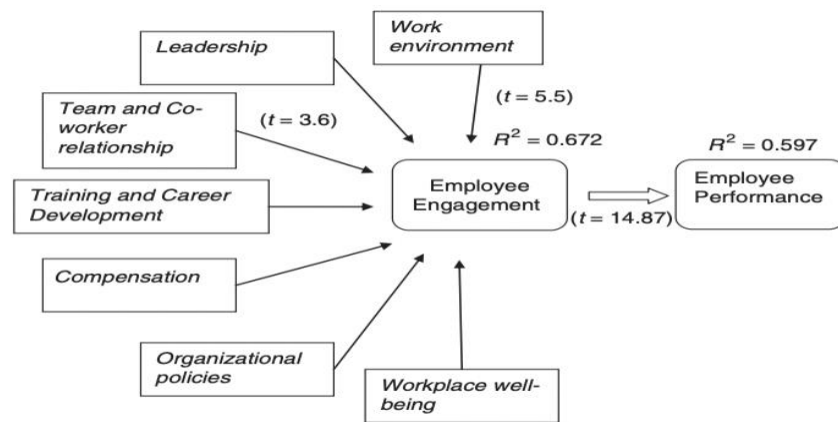


Figure 2.1 Anita's Model

2.4. Leadership

The qualities and personalities of an individual's leaders and subordinates, together with the culture, environment, aims, and objectives of an organisation, all contribute to the formation of an individual's unique leadership style (Rehman et al., 2018). A style of leadership that can be leveraged to inspire and encourage personnel is required in order to be able to transform those requirements into actions. However, it can be challenging for organisations to identify leadership styles that lower employee turnover, increase a sense of belonging to the company, and improve productivity and efficiency. These goals can be accomplished by promoting a sense of belonging, promoting a sense of belonging, and improving productivity (Chin et al., 2019).

Leadership is an ever-evolving notion that necessitates continual change not just in the leaders themselves but also in their followers and the circumstances in which they often find themselves. According to Jena, Lalatendu & Pradhan, Sajeet & Panigrahy,

Np (2018) various leadership styles have diverse consequences on the relationships that develop between leaders and the people they supervise. The style of leadership that is shown is impacted by individualities as well as the behaviour of organisations, and it may serve as a predictor of leadership style, a leader's inclination for participatory decision making, and the quality of the connection between a leader and a follower (Shin et al., 2017). In addition, Schmid (2006) highlighted that the personal traits of a leader as well as the particular style of leadership that is adopted across an organisation may have an effect on the behaviour of the company. It is possible for leaders to develop organisational and institutional behaviour patterns according to their own personal traits and in a manner that is consistent with the style of leadership they use inside the business. It's possible that these personal qualities have a role in determining how a leader's approach may influence a company and the people who work there.

2.5. Relationship between Leadership and Employee Engagement

Substantial data on the leadership styles that generate excellent employee engagement outcomes has been supplied by research conducted in academic institutions and by consulting businesses. According to Popli and Rizvi (2016) found that there are substantial links between leadership styles and employee engagement, as well as the role that each style plays in the process of establishing an engaged culture. Leadership seems to be a driving factor for employee engagement, as proven in both academic research and practise. Leaders inspire workers to be mindful of vital concerns that help them to see fresh perspective on the difficulties they confront (Mozammel & Haan, 2016). Employee participation in decision-making, providing employees with constructive feedback, providing opportunities for career advancement, and designing

performance development plans are all potential drivers of employee engagement (Popli & Rizvi, 2016).

Conformance to Akanji, Mordi, Hakeem, Sanni (2018), the leadership styles that are used in the management of workers may have a significant role in influencing organisational behaviour and having an effect on employee engagement. In addition, the manner in which leadership is exercised may be an important component that has a considerable impact on the magnitude to which employees are interested in and engaged with their work (Glanz, 2002). According to Raines (2011), it is possible for businesses to achieve greater levels of success when workers at all levels of the company participate in all facets of the enterprise. As a consequence of this, leadership style may play a role in the development of a corporate culture that encourages workers to be more involved in their job and more eager to contribute feedback about changes and issues in the workplace. In the manner of Zeb, Alam, Shafiq and Saeed (2018), the performance of an organisation may be evaluated based on its style of leadership, which also suggests that leadership may have an impact on the success or failure of an organisation. According to Gill (2011), a leadership style may impact employee engagement as well as the ability of employees to fulfil corporate goals by providing them with direction and empowerment. In addition, employees who are interested in their job may assist drive their teammates to achieve the objectives of the company. Actively engaged workers may be important assets for a business and may help organisations attain the same level of success as their rivals.

Harter et al. (2009) conducted an extensive review of literature to examine how the Gallup Q12 survey is linked to leadership outcomes. The Q12 survey assesses

employee engagement through twelve key questions that cover various aspects of the work environment, such as communication, recognition, and opportunities for development. Their analysis of 199 studies that employed the Q12 survey to measure employee engagement revealed a significant positive correlation between engagement and various leadership outcomes, such as productivity, customer satisfaction, employee retention, and profitability.

2.6. Training and Career Development

Training and career development are critical components of an organization's talent management strategy, aimed at improving employee performance, engagement, and retention (Noe, 2017). In recent years, various literature on the effectiveness of training and career development programs in achieving these goals. According to recent studies, training and development programs can positively impact employee performance and engagement (Tannenbaum & Yukl, 2019). The provision of appropriate training can improve employees' knowledge, skills, and abilities, leading to increased job performance and job satisfaction (Barrick, Thurgood, Smith, & Courtright, 2015). Additionally, career development programs can increase employee motivation and commitment to the organization, as employees perceive opportunities for career growth and development as a form of support from the organization.

Employees' perceptions of their careers being well managed might boost their feeling of professional satisfaction (Kong, Cheung, & Song, 2011). There are a lot of companies that provide excellent career support activities for their workers, such as career seminars, mentors, possibilities for training, and financial assistance for further study. When workers are made aware of the career supports that their organisations

provide, they contribute more to their positions and, as a result, achieve the career satisfaction objectives that they have set for themselves.

2.7. Relationship between Training and Career Development and Employee Engagement

Employee engagement can be significantly boosted through training and career development programs, which provide opportunities for employees to advance their skills and careers within the organization. According to Kular, Gatenby, Rees, Soane, and Truss (2018), these programs are considered critical for employee engagement. Recent studies have explored the link between training, career development, and employee engagement and found that these programs positively influence employee attitudes and behaviours. Liu, Siu, and Shi (2020) noted that several studies have reported a positive correlation between training and development programs and employee engagement. Additionally, career development programs can increase employee motivation and commitment to the organization, as employees perceive opportunities for career growth and development as a form of support from the organization (Hall, 2016). Personalized training and development programs have also been found to be particularly effective in improving employee engagement (Hernandez et al., 2017). By tailoring training programs to individual employees' needs, organizations can demonstrate their investment in employees' professional development, which can lead to increased engagement and loyalty. In addition to training and career development, research has also highlighted the role of career planning and development opportunities in promoting employee engagement (Mokhtarian & Panahi, 2020). By providing employees with clear career paths and

opportunities for advancement, organizations can help employees feel valued and supported, which can lead to greater engagement and commitment.

2.8. Compensation

Compensation system may be seen as remuneration that is provided to employees by their company as a direct consequence of the employees' engagement (Wood & De-Menezes, 1998). It is also possible to think of it as an acceptable and fair payment for workers in recognition of the efforts they have made toward the accomplishment of corporate goals and objectives (Armstrong & Brown, 2001). Recent research has focused on various aspects of compensation, including pay level, pay structure, and pay-for-performance programs. One important finding is that employees' perceptions of their compensation, rather than the objective level of pay, are more strongly related to job satisfaction, motivation, and performance (Milkovich & Newman, 2019). This suggests that organizations need to pay attention to how employees perceive their compensation, as well as how it compares to external benchmarks and internal equity considerations. Another important trend in compensation research is the use of variable pay, such as bonuses, profit-sharing, and stock options, as a way to align employees' interests with the organization's performance and goals (Cascio, 2018). Studies have shown that variable pay can improve employee motivation and engagement, particularly when it is tied to clear and measurable performance goals (O'Boyle & Aguinis, 2020). However, it is important to design these programs carefully to avoid unintended consequences, such as encouraging unethical behaviour or creating a sense of competition and conflict among employees.

According to Adeoye (2019), compensation is an essential part of managing people in order to attain effectiveness and efficiency. In the end, it contributes to an increase in the efficiency of an organisation as a whole by serving as a tool to boost employee motivation and retention. The organization's vision, goal, and strategy all have a role in the creation of the organization's pay system. The parties involved in an employment relationship may each stand to benefit from effective compensation.

2.9. Relationship between Compensation and Employee Engagement

Because of this, it is essential for businesses to have an effective compensation management system in place, as this will incentivize their workers to continue working for the company. According to Ortiz et al. (2013), pay and incentive programmes make a significant contribution to the success of organisations by affecting the actions of individuals as well as the behaviours of groups. Kwon et al. (2016), who argued that solid remuneration policies assist in encouraging people towards their task and that these policies also have a substantial impact on employee engagement, provide evidence that corroborates this claim. According to Krishnaveni and Monica (2016), an efficient pay structure will lower an organization's difficulties with attrition and the cost of recruiting. In a similar vein, Jiang and Men (2017) emphasise that increased levels of salary and benefits lead to increased levels of employee engagement. Therefore, salary and incentive programmes are essential components of employee engagement since they drive people to accomplish more and to concentrate more on their job and their own personal growth. Recent research has highlighted the importance of a total rewards approach to compensation, which includes not only base pay but also variable pay, benefits, and other rewards and recognition programs (Cascio, 2018). This approach is designed to create a more comprehensive and

integrated compensation package that aligns with the organization's strategic goals and values, as well as the needs and preferences of employees. Studies have shown that there is a positive relationship between compensation and employee engagement (O'Boyle & Aguinis, 2020). In particular, higher levels of pay and benefits are associated with higher levels of engagement, as employees perceive these rewards as an indication of the organization's commitment to their well-being and success (Kim, Lee, & Kim, 2021). Additionally, recognition and reward programs, such as bonuses, stock options, and employee of the month programs, can increase employee motivation and engagement by providing a sense of achievement and recognition for their contributions (Harvard Business Review, 2020).

2.10. Work Environment

Recent studies have found that a positive work environment, which includes factors such as good air quality, comfortable lighting, and ergonomic furniture, can have a significant impact on employee well-being (Lee & Brand, 2020; Alotaibi et al., 2021). Additionally, studies have shown that a work environment that promotes physical activity, such as standing desks and walking meetings, can also have a positive effect on employee health and well-being (Dutta et al., 2020).

A positive work environment has been found to increase employee job satisfaction, motivation, and productivity (Alkahtani et al., 2020; Menguc & Auh, 2021). A positive work environment can also lead to increased employee retention and engagement, which can result in reduced turnover costs and increased organizational performance (Menguc & Auh, 2021).

2.11. Relationship between Organization Policy and Employee Engagement

Anitha (2014) claims that there is a considerable association between the work environment and the level of employee engagement. When considering whether or not to continue working for an organisation, workers give significant weight to the conditions of their working environment. The presence of a secure working environment might encourage more potential employees to submit their resumes for consideration for open jobs in the company. People want to work in an atmosphere that is secure, thus the working conditions play a significant part in this. Working environment is one of the factors that can be utilised to assess the amount of engagement present in each individual employee who is employed by the firm. According to research conducted by Miles (2001) and Harter et al. (2001), different components of the working environment may lead to varying degrees of employee involvement. May et al. (2004), provided evidence to back up this claim . Management that fosters a supportive working environment is characterised by businesses that fulfil their responsibilities to employees, demonstrate concern for the employees' needs and feelings, offer positive feedback, and give workers the opportunity to voice their concerns, learn new skills, and find solutions to work-related issues. Organizations that meet these criteria are referred to as "playing their roles" (Deci & Ryan, 1987).

2.12. Social Exchange Theory

Social exchange theory (SET) is a widely used theoretical framework in the study of employee engagement. SET proposes that employees engage in a reciprocal relationship with their organization, where they exchange various resources, such as

effort, time, and skills, for rewards, such as compensation, recognition, and career development opportunities. This exchange relationship influences employees' attitudes and behaviours towards their work and organization.

Studies have shown that social exchange relationships are positively associated with employee engagement. For example, employees who perceive that their organization values and rewards their contributions are more likely to be engaged and satisfied with their job (Miao et al., 2018). Moreover, employees who receive development opportunities such as training and career advancement are more likely to feel valued and committed to their organization (Cao et al., 2018).

However, social exchange relationships are not always positive. When employees perceive that their organization is not fulfilling its part of the exchange, they may become disengaged and even withdraw their effort and commitment. For example, employees who perceive that their pay or benefits are not commensurate with their effort or skills may become disengaged and seek employment elsewhere (Gupta et al., 2020).

Recent studies have focused on the relationship between SET and employee engagement. These studies have shown that when employees perceive that they receive fair and equitable rewards in exchange for their contributions, they are more likely to feel engaged and committed to their work and organization (Feng et al., 2018). Conversely, when employees perceive that the exchange relationship is unfair or unbalanced, they are more likely to experience negative emotions, such as frustration and dissatisfaction, and to disengage from their work (Cropanzano & Mitchell, 2018).

Furthermore, recent research has examined the role of different types of rewards in the SET-employee engagement relationship. For example, studies have shown that extrinsic rewards, such as pay and benefits, are important for attracting and retaining employees, but they may not be as effective in fostering employee engagement as intrinsic rewards, such as meaningful work and autonomy (Mauno et al., 2019). Therefore, organizations need to consider a range of rewards that appeal to different employee needs and motivations.

Enache et al. (2018) conducted an integrative literature review to explore the relationship between employee engagement and social exchange theory. The authors note that social exchange theory posits that individuals form relationships and exchanges based on mutual benefits and obligations. In the workplace, this can involve exchanges between employees and their supervisors, colleagues, and the organization as a whole.

The authors found that social exchange theory can help explain how employees' perceptions of their work environment and their relationships with others affect their levels of engagement and commitment to the organization. For example, when employees perceive that their supervisors and colleagues are supportive and fair, they are more likely to engage in extra-role behaviors, such as helping others or volunteering for additional tasks.

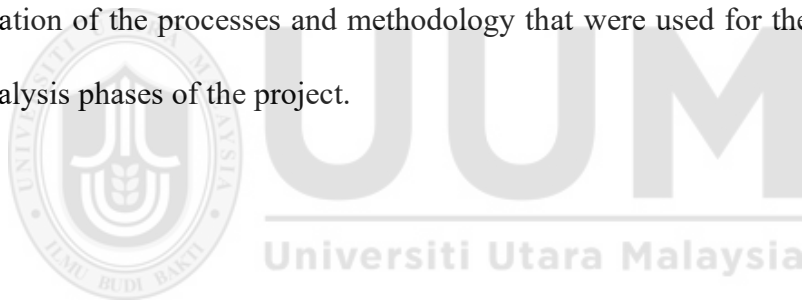
In addition, the authors found that social exchange theory can inform strategies for promoting employee engagement. For instance, organizations can create supportive work environments that foster positive relationships between employees and their supervisors and colleagues. They can also provide opportunities for employees to

participate in decision-making processes and feel a sense of ownership and autonomy in their work.

Overall, Enache et al. (2018) suggest that social exchange theory provides a useful framework for understanding and promoting employee engagement in the workplace.

2.13. Summary

This chapter has, for the most part, provided a summary of a literature study that concentrated on the connection between different human resource strategies and the level of employee engagement. Following the completion of the literature research, a framework was developed, and in the following chapter, we will provide an in-depth explanation of the processes and methodology that were used for the data collecting and analysis phases of the project.



CHAPTER 3

METHODOLOGY

3.1. Introduction

The section on methodology is a critical component of any research project, as it provides a detailed account of how the research is conducted. This chapter's primary objective is to present a concise and transparent account of the research design, data collection techniques, data analysis methods, ethical considerations, and population and sample under investigation. The researcher provided an in-depth description of the research , approach, design, and strategy used in addressing the research questions. Furthermore, the chapter discussed the quantitative data collection methods used, as well as the sampling techniques employed. In addition, the chapter delved into the data analysis techniques used, such as the software or tools utilized for data analysis. The ethical considerations relevant to the research work, including confidentiality, informed consent, anonymity, and privacy, are explicitly outlined.

3.2. Research Framework

In light of the examination of the literature that came before it, the conceptual framework that is presented here is significant in the larger context of knowledge sharing and understanding the factors investigated. The purpose of the research was to investigate the factors that contribute to employee engagement and the impact these factors have on employee engagement among engineers in selected Malaysian medical device manufacturing companies. Therefore, the research framework began by

concentrating on the factors that lead up to employee engagement at Malaysian medical device manufacturing companies. The factors that led up to an employee being engaged in their work are evaluated using a research concept.

Independent Variable

Dependent Variable

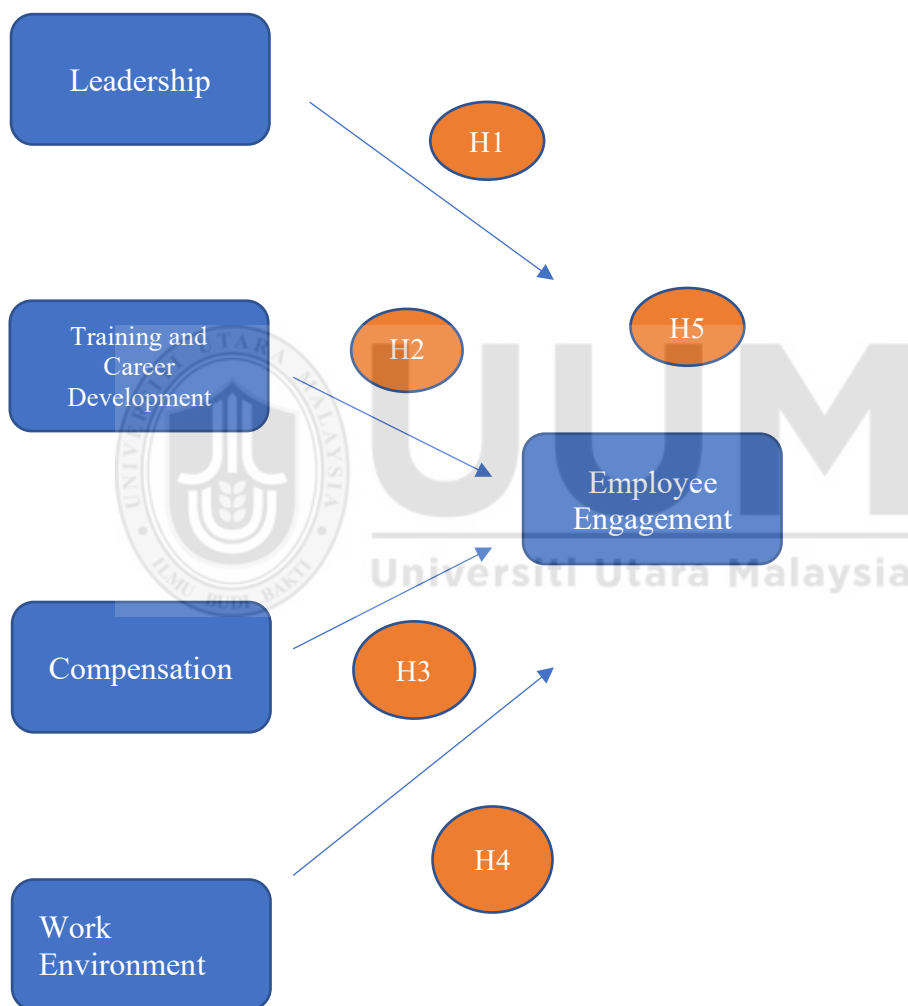


Figure 3.1 : Conceptual Framework

Key determinants for employee engagement were found from published literatures and prior research which were summed up into four primary constructs including;

‘leadership’, ‘training and career development’, ‘compensation’ and ‘work environment.’ These constructs have already been demonstrated to influence the degree of employee engagement in an organisation (Anitha, 2014). The ensuing circumstance effects the Total Quality Management Implementation at Malaysian medical device manufacturing companies.

3.3. Hypotheses Development

Hypotheses generated for the purpose of empirical testing and validation in relation to this research. These hypotheses developed based on the social exchange theory. Employee engagement served as the dependent variable in this research; the other four factors—compensation, work environment, leadership, and training and career development—served as independent variables. As a result of this study, four hypotheses were formulated, examined, and shown to be correct.

H1: There is a significant relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

H2: There is a significant relationship between training and career development and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

H3: There is a significant relationship between compensation and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

H4: There is a significant relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

H5 : There is an effect of leadership, training and development, compensation, and work environment on employee engagement among engineers in selected Malaysian medical device manufacturing companies.

3.4. Research Design

Research surveys are a popular method for collecting data in social science research. Surveys means to collect large amounts of data from a broad range of respondents and can be administered via various modes, including online, mail, telephone, or in-person.

Another trend was the focus on survey design and questionnaire development. The researchers emphasized the importance of designing effective survey instruments that are valid, reliable, and unbiased. Attention was given to issues such as question wording, response options, and the use of skip patterns.

Finally, there was a growing awareness of the importance of sampling and data quality in survey research. Researchers emphasized the need to use appropriate sampling methods to ensure representative and reliable data. Quality control measures, such as pretesting and data cleaning, were also emphasized to minimize errors and biases in data.

3.5. Population

Recent literature has emphasized the importance of considering the intersectionality of population characteristics, such as race, gender, and socioeconomic status (Crenshaw, 2020). This approach recognizes the complex and interconnected nature of social identities and experiences and highlights the need for policies and programs that address multiple dimensions of inequality and discrimination. In addition, recent years have seen the rise of innovative methods for understanding and analysing populations, such as big data analysis, machine learning, and geospatial analysis (Kitchin, 2020). These methods have the potential to provide new insights and perspectives on population trends and patterns, particularly in areas where traditional methods may be limited.

For this study, the population, or the available population, comprised of all workers of the research location who matched the following criteria: (a) were engineers (b) belonged to Malaysian Medical Device Manufacturing that is manufacturing a Class C and D device and (c) Participants were identified from the companies below :

- Abbott Medical Device Division (Previously Known As St. Jude Medical Operations Sdn Bhd)
- Teleflex Medical Sdn Bhd
- Boston Scientific Medical Device (Malaysia) Sdn. Bhd
- Smith & Nephew Operations Sdn Bhd
- Lake Region Medical Sdn Bhd

There are various departments in these companies, but for this survey, only engineers had participated. Engineers at the shop floor level in the manufacturing business are required to carry out very dull and repetitive work duties for an extended length of their career. In addition, staff on the shop floor are under continual pressure and are expected to meet the planned production level while maintaining quality that is the best in class. Their degree of weariness and stress might rise as a result of doing the same professional activity with an intense attention on a continual and continuous basis, which could ultimately lead to job burnout. In the past, most research on employee burnout has been conducted in service sectors, which are positions that demand a high level of human connection. On the other hand, the level of employee engagement are seldom ever examined in the industrial sector, particularly at the shop floor level, where engineers are engaged in the performance of routine responsibilities.

Table 3.1
Number of employees in the engineering department

Companies	Number of staffs
Abbott Medical Device Division	50
Teleflex Medical Sdn Bhd	80
Boston Scientific Medical Device (Malaysia) Sdn. Bhd	70
Smith & Nephew Operations Sdn Bhd	40
Lake Region Medical Sdn Bhd	30
Total	270

The study population consisted of 270 employees who were working in the engineering departments, as outlined in Table 3.1.

3.6. Sample

In quantitative research, one methodology that is often used is called purposive sampling. This method includes choosing participants based on certain features or attributes that are pertinent to the study subject (Palinkas et al., 2015). This method enables researchers to concentrate their efforts on certain people who have the potential to provide insightful perspectives on the issue of interest and to contribute to the overall richness and depth of the study (Patton, 2015).

According to Sekaran and Bougie (2016), sampling is "a process of picking the correct persons, objects, or events as representations for the whole population". In this part, the sampling procedure for this study includes defining the population, choosing the sample frame, sampling design, and sample size. The population is defined as the initial phase in the sampling technique. A population is referred to as a universe of units (Bryman, 2012). Krejcie and Morgan (1970) created a table that may be used as a quick reference to determine the appropriate sample size for a given population. The Krejcie and Morgan tables may be used, provided that the population size being considered is either known or accessible. Table 3.2 displays a generalised scientific approach for determining sample size (Sekaran and Bougie 2010).

The optimum sample size for the given population of 270 is 159 responses where at least 47 samples given to Abbott Medical Device Division , at least 41 samples distributed to Teleflex Medical Sdn Bhd, at least 24 samples passed to Boston Scientific Medical Device (Malaysia) Sdn. Bhd, at least 18 samples distributed to

Smith & Nephew Operations Sdn Bhd and 29 samples distributed to Lake Region Medical Sdn Bhd..The goal and objective of the survey were explained to the respondents. They were given enough time to finish the survey. It took roughly 10-15 minutes to complete the survey. The completed surveys were promptly collected , entered and analysed in SPSS version 27.

Palinkas et al. (2015) define purposive sampling as a non-probability sampling method frequently used in qualitative research to choose participants based on specific characteristics or criteria. The technique is particularly useful for researchers seeking a deeper understanding of a particular phenomenon rather than generalizing to a larger population, according to Patton (1990). Guest et al. (2012) identify several types of purposive sampling techniques, including maximum variation, snowball, and criterion sampling. Maximum variation sampling selects participants who differ in demographic or experiential characteristics, while snowball sampling recruits participants through referrals from other participants, and criterion sampling selects participants based on possessing a specific relevant trait. Purposive sampling has been criticized for its lack of generalizability and potential for researcher bias, but advocates argue that it allows for an in-depth exploration of a phenomenon and can lead to greater insights and understanding. Moreover, it can be useful for research involving hard-to-reach or marginalized populations. It is crucial for researchers to consider the limitations and potential biases associated with the technique while utilizing purposive sampling for qualitative research (Palinkas et al., 2015; Guest et al., 2012).

Table 3.2
Sample size for a Given Population Size

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

3.7. Research Instruments

The study questionnaire has 32 questions. The research was conducted remotely and online through the usage of Google forms.

The following is how the questionnaire is broken up into its three sections:

a) The first section is dedicated to inquiries about the respondent's history or demographics. Questions on age, marital status, education, and length of service were included in the demographics section.

b) Second section discusses employee engagement. The questionnaire has a Likert scale with five points, with possible responses ranging from one to five. (1=Strongly Disagree, 2= Disagree 3=Neutral 4 ="agree," while 5= "strongly agree."

c) The third part discusses topics such as leadership, training and career development, compensation and working environment.

3.8. Employee Engagement Questionnaire

This survey is a copy of the Gallup Q12® workplace audit. It looked as if the most effective technique of data collection, as well as a genuine and dependable alternative, would be to make use of an online quantitative questionnaire. Employee engagement may be accurately measured with the use of the Gallup Q12® workplace audit. This has been shown time and time again (Harter et al, 2009).

Table 3.3*Items for Employee Engagement*

Code	Items
EE1	I know what is expected of me at work
EE2	I have the materials and equipment I need to do my work right
EE3	At work, I have the opportunity to do what I do best everyday
EE4	In the last seven days, I have received recognition or praise for doing good work
EE5	My supervisor, or someone at work, seems to care about me as a person
EE6	There is someone at work who encourages my development
EE7	At work, my opinions seem to count
EE8	The mission or purpose of my company makes me feel my job is important
EE9	My associates or fellow employees are committed to doing quality work
EE10	I have a best friend at work
EE11	In the last six months, someone at work has talked to me about my progress
EE12	This last year, I have had opportunities at work to learn and grow

3.9. Leadership Questionnaire

Leadership is a critical factor in promoting employee engagement in the workplace (Harter et al., 2002; Saks, 2006; Kim et al., 2017). The VA All Employee Survey (AES) is a tool used to assess employee engagement in the Department of Veterans Affairs (VA). The AES includes questions related to leadership and supervisor effectiveness, as well as other factors related to employee engagement (Department of Veterans Affairs, 2020).

Table 3.4*Items for Leadership*

Code	Items
LD1	Supervisors in my work unit support employee development
LD2	My supervisor listens to what I have to say
LD3	My supervisor treats me with respect.
LD4	I have trust and confidence in my supervisor.
LD5	My immediate supervisor does a good job.

3.10. Training and Career Development Questionnaire

The OCM scale was established by Kong, Cheung, and Song (2011). It is comprised of three factors: Career Development Program, Career Appraisal and Advice, and Career Training. In this survey, a total 5-item OCM scale was used to assess the construct.

Table 3.5*Items for Training and Career Development*

Code	Items
TCD1	My performance has improved as a result of the skills i have developed over the past years
TCD2	There are opportunities for me to develop my career
TCD3	Training and development I have received is helping me to develop my career
TCD4	My work gives me a sense of personal accomplishment
TCD5	I have training and development plan

3.11. Compensation Questionnaire

Compensation Management Questionnaire Scale (CMQS) developed by (Adeoye, 2019) was used an instrument to measure compensation variable.

Table 3.6*Items for Compensation*

Code	Items
CPN1	I'm satisfied with the consistency of the company's pay policies
CPN2	I'm satisfied with my take home pay
CPN3	I'm satisfied with my benefit package
CPN4	I'm satisfied with the recent increase in my salary
CPN5	I'm satisfied with my overall pay structure

3.12. Working Environment Questionnaire

Chandrasekar (2011) have investigated the working environment by taking a wide range of public sector jobs into consideration. The degree of performance of employees in an organisation is the primary subject of their study. The organisation maintains an interactive working environment.

Table 3.7*Items for Working Environment*

Code	Items
WE1	My work area is sufficiently equipped for my typical needs (normal, storage, movements, etc).
WE2	My job tends to directly affect my health.
WE3	If had a different job, my health would probably improve.
WE4	Problems associated with my job have kept me awake at night.
WE5	I often take my job home with me in the sense that I think it when doing other things.

3.13. Pilot Study

Following the creation of the instruments that were going to be used in the primary study, each instrument had its own pilot testing. This is a crucial stage in establishing the instruments' credibility and determining whether or not they are accurate (Noble & Smith, 2015). According to Mikuska (2017), by deploying the instruments to at least

12 to 50 individuals before the real study, researchers will be able to identify the strengths and weaknesses of the instrument, which will enable them to be prepared for any required revisions. As a result, thirty students working in the production of medical devices in Malaysia were chosen to participate in the pilot test. The instruments underwent extensive testing with a pilot group over the whole month of December 2022.

Moving on to the next step of validating the reliability of the questionnaire, the people who took part in the pilot study were asked to fill out a questionnaire in which they were asked to rate the extent to which they agreed or disagreed with each of the statements that were presented. The statements were evaluated using a Likert scale that ranged from "1 – Strongly Disagree" to "5 – Strongly Agree," with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree." In order to calculate the Cronbach's Alpha reliability coefficient, the responses to the questionnaire were tabulated in SPSS Version 27 after being collected and analysed. According to Taber (2018), Cronbach's Alpha is a measure of scale reliability that may be used to identify the consistency in relatedness of a collection of items within a group. This can be done by analysing the correlation between the items in the set. The reliability statistics of the data obtained from the questionnaire are shown in the table that may be found below.

Table 3.8
Reliability Test for Pilot Study

Variable	No. of items	Cronbach's Alpha
<u>Independent Variable</u>		
Leadership	5	0.998
Training & Career Development	5	0.996
Compensation	5	0.994
Work Environment	5	0.994
<u>Dependent Variable</u>	12	0.999
Employee Engagement		
Overall	32	0.978

According to Vaske et al. (2017), a Cronbach's Alpha value that is more than or equal to 0. is a fantastic indicator of a solid internal consistency and a dependable group of items.

The information presented in Table 3.3 shows the Cronbach Alpha coefficients for various factors including leadership, training and career development, compensation, and work environment. Cronbach Alpha is a measure of internal consistency, which reflects the extent to which a set of questionnaire questions are measuring the same underlying construct. A high Cronbach Alpha value suggests that the questions are measuring the same construct consistently. In this study, the Cronbach Alpha coefficient for leadership is 0.998, which is very high and indicates that the set of questions related to leadership are measuring the same underlying construct with high consistency. Similarly, the Cronbach Alpha coefficients for training and career development, compensation, and work environment are 0.996, 0.994, and 0.994,

respectively, indicating high internal consistency for the questionnaire questions related to these factors.

The dependent variable in this study is employee engagement, and the Cronbach Alpha coefficient for this variable is 0.999 suggests that the questions related to employee engagement are measuring the same underlying construct with high consistency.

The overall result for both the independent and dependent variables is considered satisfactory with a value of 0.8, which exceeds the minimum acceptable threshold of 0.6. This means that the questionnaire questions are measuring the constructs consistently and with high reliability.

The data shown in the table also indicate that the sets of questionnaire questions have a high level of internal consistency, as indicated by a Cronbach's Alpha value of 0.978. This suggests that the questionnaire is a reliable and trustworthy source of instrument information. Therefore, the results obtained from the study are more likely to be accurate and representative of the population being studied.

3.14. Data Collection Strategy

Surveys are effective method for answering the questions on the relationships that were investigated for numerous reasons. The use of surveys in study is acceptable since they enabled to collect a greater volume of information in a shorter period of time than would have been possible using other methods (Groves et al., 2009). All the surveys that were utilised had ratings based on a Likert scale, which meant that respondents simply needed to indicate their degree of agreement with the statements rather than having to write responses to the questions. In the initial step of the study project, the

researcher gathered data by conducting a survey using a Google form. Additionally, a text message was sent via Whatsapp to fill out their surveys.

3.15. Data Analysis Technique

The process of organizing data into new and valuable formats is known as "data analysis". To organize the information gathered from the respondents, the researcher used a software called the Statistical Package for the Social Sciences, commonly referred to as SPSS. This is the primary method used for data collection. For the present study, SPSS version 27 was utilized as the main analytical tool for data analysis. The statistical methods employed in this research include frequency analysis, descriptive statistics, and correlation analysis. The following data analysis techniques are utilized:

3.16. Reliability Analysis

Sekaran and Bougie (2013) state that a reliability test is crucial to maintain consistency throughout a test, survey, observation, or any other measuring instrument. This is important to ensure that the data is reliable and that the test's outcome remains consistent no matter how many times it is taken. In this study, the reliability of the measurements was evaluated using the Cronbach's Alpha statistic. Cronbach's Alpha is a reliability coefficient that measures the strength of the positive connection between the items in a set. An organization's internal consistency reliability can be evaluated by how close its Cronbach's alpha score is to 1.

3.17. Descriptive Analysis

Descriptive analysis is the quantitative and tangible approach of defining the primary characteristic of the data. In other terms, descriptive analysis is a research study that

summarises the variables in a researcher-relevant scenario (Sekaran & Bougie, 2013). According to Sekaran and Bougie (2013), descriptive analysis for each variable may be given more precisely. In addition, data interpretation may be presented as a histogram, bar chart, or pie chart.

3.18. Pearson Correlation Matrix

The Pearson correlation matrix showed the direction, strength, and significance of the bivariate connections among all interval or ratio-level variables, as stated by (Sekaran & Bougie, 2013). Determining the strength of a correlation requires analysing the changes in one variable in relation to the shifts in another. Data analysis utilising a Person correlation matrix allows one to determine the strength of relationships between different sets of data and test hypotheses about the correlation between different sets of variables.

3.19. Regression Analysis

Regression analysis is a statistical technique that is utilized to investigate the association between one or more independent variables and a dependent variable. The primary aim of regression analysis is to establish a model that can be employed to anticipate the dependent variable based on the values of the independent variables (Field, 2020).

3.20. Summary

This chapter provides an explanation of the research approach that was used for the study. It detailed the methodology behind the selection of the representative sample of respondents, the evolution of the study materials, and the process of data collecting.

This chapter also describes the implementation of numerous analyses in Statistical Package for Social Science (SPSS), such as correlation and regression, in order to evaluate the study hypothesis. Following that, in chapter four, the research described in full exactly what the conclusions of this study were.



CHAPTER 4

RESULTS AND DISCUSSION

4.1. Introduction

In this chapter, the findings of the analyses that were conducted using SPSS are provided. Next, a discussion of the preliminary data screening and the first analysis took place. In this section, the outcomes of the hypotheses that were tested in the research as well as the descriptive statistics on the information about the respondents and the constructs themselves are provided.

4.2. Response Rate

In the course of this research, a total of two hundred questionnaires were distributed to engineers working for the companies Abbott Medical Device Division, Teleflex Medical Sdn Bhd, Boston Scientific Medical Device (Malaysia) Sdn. Bhd, Smith & Nephew Operations Sdn Bhd, and Lake Region Medical Sdn Bhd. In an effort to get a high response rate from respondents, reminders were made. Additionally, a text message was sent via Whatsapp to fill out their surveys. As a result, these efforts resulted in 174 returned surveys out of the total of 200 questionnaires that were delivered to the respondents who were the focus of the study even though the minimum requirement is only 159 respondents for a population of 270.

Table 4.1.
Response Rate of Questionnaire

Response	Frequency/Rate
No. Of distributed questionnaires	200
Returned questionnaires	174
Returned and excluded questionnaires	6
Unreturned Questionnaire	20
Valid Response Rate	87%

4.3. Demographics Characteristics of Respondents

The respondents' demographic characteristics are of major importance to the investigation. Age, education level and duration of work are the instruments employed in this study's demographic analysis.

4.4. Characteristic of respondents by age

In Table 4.2, it denotes the specific ages of respondents who filled out the surveys. According to the data shown in Table 4.2, among the workforce, there were a total of 31 individuals (or 17.8%) who belonged to the age range of 18 to 24 years old. In the meanwhile, the workers aged 25-34 made up 44.3% of the total responses with 77 individuals, which was the biggest percentage of any age group. This is followed by the second biggest percentage of respondents around the age of 51 (29.3%), which are workers between the ages of 35 and 44 years old. Next, there are a total of 11 (6.3%) workers who are between the ages of 45 and 54 years old, and there are a total of 4 (2.3%) responders who are 55 years old or older.

Table 4.2*Characteristic of age*

Age	Frequency	Percentage (%)
18-24 years	31	17.8
25-34 years	77	44.3
35-44 years	51	29.3
45-54 years	11	6.3
55 and above	4	2.3
Total	174	100

4.5. Characteristics of Education Level

This research also conducted an analysis of the data pertaining to the duration of employment held by the various workers. The following table shows that the greatest education level among workers is Bachelor's Degree with 109 of them (62.6%), and the second highest education level among the population is Diploma qualification with 35 of them (20.1%). The next employee to have a master's degree is number 24, which accounts for 14.4%. There are a total of 5 workers, or 2.9%, who have a PhD certification. This demonstrates that the majority of individuals now working have at least a bachelor's degree in their field.

Table 4.3*Characteristic of education level*

Education Level	Frequency	Percentage (%)
Diploma	35	20.1
Degree	109	62.6
Masters	25	14.4

PhD	5	2.9
Total	174	100

4.6. Length of Employment

This research also conducts an examination of the data pertaining to the duration of employment held by workers. According to the data shown in Table 4.4, two and a half percent of the workforce has been with the company for less than a year. The largest population of workers has a work experience of between 5 and 9 years, with a frequency of 95 (54,6%), followed by 48 (27,6%) people with work experience ranging from 1 to 4 years. Following that comes the population of people who have worked for the organisation for 10 to 14 years, which totals 15 (8.6% of the total population). Eight of the workers, or 4.6%, had worked for the company for 15 to 19 years at the time of the survey. Finally, individuals with 20 years of service or more with the company make up 4 (2.3% of total employees) of the workforce here. The findings of this research demonstrate that the bulk of the information collected came from individuals who had spent between five and nine years working for the business.

Table 4.4
Characteristic of length of employment

Employee	Frequency	Percentage (%)
Less than 1 year	4	2.3
1 to 4 years	48	27.6
5 to 9 years	95	54.6
10 to 14 years	15	8.5
15 to 19 years	8	4.6
20 years and above	4	2.3
Total	174	100

4.7. Reliability Analysis

Following this, the researcher additionally carried out an analysis to assess individual variables such as leadership, training and career development, remuneration, and the working environment. The dependent variable of employee engagement was also measured in this study. When it came to testing the reliability of the items in both the independent and the dependent variables, the Cronbach's Alpha value was the one that was used for this procedure. The results obtained are outlined in Table 4.5 below, which provides an indication of the Cronbach's Alpha value for each item used in the measurement of the independent variable and the dependent variable.

Table 4.5
Reliability coefficients for the study variables

INDEPENDENT		
VARIABLES	NO OF ITEM	CRONBACH'S ALPHA
Leadership	5	0.923
Training & Career Development	5	0.903
Compensation	5	0.915
Work Environment	5	0.882
DEPENDENT		
VARIABLE	NO OF ITEM	CRONBACH'S ALPHA
Employee Engagement	12	0.963

The value of Cronbach's Alpha for leadership is 0.923, the value for training and career development is 0.903, the value for compensation is 0.915, and the value for the work environment is 0.882. In aggregate, the results of these independent variables reveal that they perform quite well. This demonstrates that the structured questions included in this research have an internal consistency. The value of Cronbach's alpha for

measuring the level of employee engagement is 0.963. Due to the fact that there was a high level of dependability between each of the items, none of them were removed from the test.

4.8. Descriptive Statistics

The nature of descriptive statistics is similar to that of arithmetic means, which is to say that the average of what the respondents are expressing in terms of their conformance to the claims and their perspective of the subject is being taken into account. As shown in Table 4.6 below, the computed standard deviations for participants for overall employee engagement as the dependent variable have a weighted average of 3.5176 and a standard deviation of 0.89821. This serves as confirmation that there may be a large dispersion from what the respondents are saying.

Table 4.6
Descriptive Statistics

VARIABLE	MEAN	STANDARD DEVIATION
Employee Engagement	3.5176	0.89821
Leadership	3.5658	0.93518
Training & Career Development	3.5592	0.87791
Compensation	3.5780	0.92403
Work Environment	3.3147	0.97783

The results may be seen in Table 4.6. On a scale from 1 to 5, all of the factors were evaluated. It is clear from the results shown above that the majority of respondents

selected the third option on the scale. The results of the questionnaire evaluation are shown in Table 4.6, with averages ranging from a low of 3.3147 to a high of 3.5780 for leadership, training and career development, salary, and work environment.

4.9. Pearson Correlation Matrix

The product moment correlation coefficient of Pearson was utilised in order to determine whether or not there is a connection between the overall level of employee engagement, which served as the dependent variable, and the aspects of leadership, training and career development, compensation, and work engagement, which served as the independent variables. However, in order to explain the link between both the dependent and the independent items that were correlated, the results of the correlation analysis are reported in Tables 4.7.

The result for the descriptive analysis is shown as below :

Table 4.7
Pearson Correlation Matrix

		Correlations				
		EE	LD	TCD	CPN	WE
EE	Pearson Correlation	1	.914**	.891**	.910**	.737**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001
	N	174	174	174	174	174
LD	Pearson Correlation	.914**	1	.874**	.884**	.743**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	174	174	174	174	174
TCD	Pearson Correlation	.891**	.874**	1	.894**	.698**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	174	174	174	174	174
CPN	Pearson Correlation	.910**	.884**	.894**	1	.718**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001
	N	174	174	174	174	174
WE	Pearson Correlation	.737**	.743**	.698**	.718**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	174	174	174	174	174

** . Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 1

H1: There is a significant relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

The study aimed to investigate the relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies. The hypothesis proposed was that there is a significant relationship between leadership and employee engagement. To test this hypothesis, the researchers computed a Pearson product moment correlation coefficient and presented the results in Table 4.7.

The outcome showed a strong positive correlation between employee alignment and employee engagement with a correlation coefficient of 0.914, indicating that employee engagement was positively associated with leadership. The result was statistically significant at a level of $p < 0.01$, which suggests that the relationship between leadership and employee engagement was not due to chance. The effect size was determined to be strong based on the interpretation of J. Cohen's (1988) guidelines. Therefore, the study provides evidence that supports the hypothesis that there is a significant relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

Hypothesis 2

H2: There is a significant relationship between training and career development and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

The hypothesis being tested in this study aimed to investigate whether there is a significant relationship between training & career development and employee engagement among engineers working in selected medical device manufacturing companies in Malaysia. The hypothesis was formulated with the expectation that there would be a positive relationship between the two variables.

The results of the correlation analysis showed a strong and statistically significant positive correlation between employee alignment and employee engagement, with a correlation coefficient (r) of 0.891 and a p -value of less than 0.01.

This indicates that there is a strong and positive relationship between training & career development and employee engagement among engineers in the selected Malaysian medical device manufacturing companies. The findings of this study suggest that investing in training and career development programs for employees can lead to higher levels of engagement, which may have positive implications for employee performance, job satisfaction, and retention.

Hypothesis 3

H3: There is a significant relationship between compensation and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

This hypothesis aimed to investigate the relationship between compensation and employee engagement among engineers in selected Malaysian medical device manufacturing companies. The hypothesis stated that there is a significant relationship between compensation and employee engagement. To test this hypothesis, a Pearson product moment correlation coefficient was calculated and presented in Table 4.7. The result showed a strong positive correlation between employee alignment and employee engagement ($r = 0.91$, $p < 0.01$), which was statistically significant according to J. Cohen's (1988) interpretation. This suggests that there is a strong and positive association between compensation and employee engagement among engineers in the selected Malaysian medical device manufacturing companies, indicating that higher levels of compensation may lead to increased levels of employee engagement.

Hypothesis 4

H4: There is a significant relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies.

The purpose of this study was to investigate the relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies. The hypothesis proposed that there is a significant relationship between work environment and employee engagement. The result of the analysis, as presented in Table 4.7, showed a strong positive correlation between employee alignment and employee engagement ($r = 0.737$, $p < 0.01$), indicating that there is a significant relationship between work environment and employee engagement. The correlation coefficient value of 0.737 suggests a strong positive association between the two variables. This finding suggests that a positive work environment is likely to contribute significantly to higher levels of employee engagement among engineers in Malaysian medical device manufacturing companies. The statistical significance of the result ($p < 0.01$) indicates that the correlation is not likely to have occurred by chance.

4.10. Multiple Regression

Regression is a method used to study the relationship between independent and dependent variables. Multiple regression analysis is used to identify the nature and strength of the relationship between the variables, as stated by Sekaran and Bougie (2013). As may be seen in the following, the descriptive analysis yielded the following results:

Table 4.8
Model of summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.945 ^a	.892	.890	.29836
a. Predictors: (Constant), WE, TCD, LD, CPN				

Hypothesis 5

H5 : There is an effect of leadership, training and development, compensation, and work environment on employee engagement among engineers in selected Malaysian medical device manufacturing companies.

Based on the information you provided, it seems that the study found that leadership, training & career development, compensation, and work environment are factors that have a higher relationship with employee engagement in the medical device manufacturing industry. The R value of 0.945 and R squared value of 0.892 suggest that these factors together explain a very high proportion of the variance in employee engagement. In this case, the R value of 0.945 suggests a strong positive effect between the factors and employee engagement. The R squared value, on the other hand, represents the proportion of variance in the dependent variable (employee engagement in this case) that is explained by the independent variables (leadership, training & career development, compensation, and work environment). A value of 1 indicates that all the variance in the dependent variable is explained by the independent variables. In this case, the R squared value of 0.892 suggests that the independent variables

(leadership, training & career development, compensation, and work environment) explain a very high proportion of the variance in employee engagement.

Table 4.9 will be used to determine which independent variables are significantly associated with the dependent variable.

Table 4.9
Coefficient Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.073	.097		.755	.451
	LD	.380	.059	.395	6.422	<.001
	TCD	.209	.063	.204	3.315	.001
	CPN	.325	.063	.335	5.178	<.001
	WE	.055	.035	.060	1.562	.120

a. Dependent Variable: EE

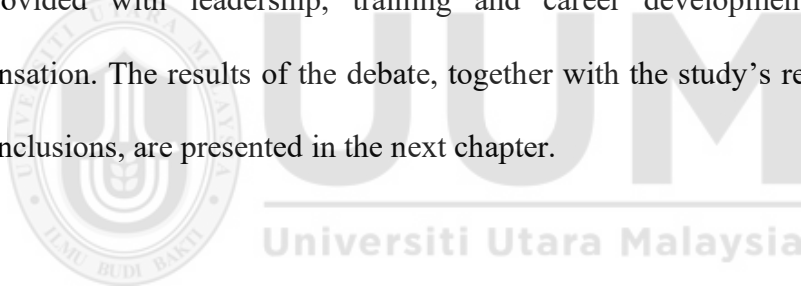
Based on the multiple regression analysis in SPSS, it can be concluded that there is a statistically significant relationship between the independent variables (leadership, training & career development, compensation, and work environment) and the dependent variable (employee engagement). The coefficient values suggest that leadership has the strongest positive effect on employee engagement, with a coefficient value of 6.422. This indicates that for every unit increase in the leadership score, employee engagement is expected to increase by 6.422 units, holding other independent variables constant. The other independent variables also have positive coefficients and are statistically significant, indicating that they also have a positive effect on employee engagement. Specifically, training & career development has a coefficient of 3.315, compensation has a coefficient of 5.178, and work environment has a coefficient of 5.178.

Table 4.10*Summary of Hypotheses Testing Results*

	Hypothesis	Results
H1	There is a significant relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies.	Accepted $p < 0.01$
H2	There is a significant relationship between training and career development and employee engagement among engineers in selected Malaysian medical device manufacturing companies.	Accepted $p < 0.01$
H3	There is a significant relationship between compensation and employee engagement among engineers in selected Malaysian medical device manufacturing companies.	Accepted $p < 0.01$
H4	There is a significant relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies.	Accepted $p < 0.01$
H5	There is an effect of leadership, training and development, compensation, and work environment on employee engagement among engineers in selected Malaysian medical device manufacturing companies.	Accepted $R = 94.5\%$

4.11. Chapter Summary

The findings of the research were presented in this chapter, and the discussion of the chapter's introduction began with a discussion of the elements that impact employee engagement among engineers working for chosen Malaysian medical device manufacturing businesses. According to the findings, only three independent factors show a substantial relationship with employee engagement among engineers working for selected Malaysian medical device manufacturing businesses. This was discovered by analysing the data collected. It demonstrates that there is no substantial connection between the work environment and the level of employee engagement. In some Malaysian firms that manufacture medical devices, employees get involved when they are provided with leadership, training and career development opportunities, compensation. The results of the debate, together with the study's recommendations and conclusions, are presented in the next chapter.



CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

In academic research, the discussion and conclusion chapter is crucial because it allows the author to bring together the findings of the study and draw meaningful conclusions. This chapter, called Chapter 5, typically includes an analysis of the research questions and hypotheses, a discussion of the study's results, an interpretation of the findings, and suggestions for further research. The author can also compare their results with previous studies and consider the theoretical implications of their findings. It's important for the researcher to acknowledge any limitations of the study and explain how these limitations may have affected the results.

5.2. Conclusion

In essence, the discussion section of this study centred around the research questions that were introduced in chapter one. The research objectives were designed to address these questions, which are listed below:

- 1) Does leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies have a significant relationship?

2) Does training and career development and employee engagement among engineers in selected Malaysian medical device manufacturing companies have a significant relationship?

3) Does compensation and employee engagement among engineers in selected Malaysian medical device manufacturing companies have a significant relationship?

4) Does work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies have a significant relationship?

5.3. Leadership and Employee Engagement

One research hypothesis was developed and evaluated as part of the process of addressing the first research question. One would remember that in Hypothesis 1, it was mentioned that there is a substantial association between leadership and employee engagement among engineers working for chosen Malaysian medical device manufacturing companies. This is something that should be noted.

This study came to the conclusion that leadership has a favourable and substantial relationship on employee engagement, which is in line with the findings of previous research on the topic (Popli & Rizvi, 2016 ; Mozammel & Haan, 2016 ; Akanji, Mordi,Hakeem,Sanni , 2018). The previous research came to the conclusion that there is a substantial connection between leadership and employee engagement; as a result, their conclusions are in line with those of this study. The findings can be interpreted as meaning that employees' understanding and interpretation of leadership among engineers in selected Malaysian medical device manufacturing companies has a

significant effect on their engagement. This includes ideas, influence, motivation, inspiration, and stimulation. As a result, what can be deduced from the data is that leadership has a substantial effect in the level of employee engagement.

As a result, the management of these companies need to improve their leadership by searching for people who possess unique attributes such as being hard working, inventive, having a good character, and having talents. For instance, in order to improve employee engagement among engineers working for chosen Malaysian medical device manufacturing businesses, leaders who have a strong vision while also caring more about their subordinates and displaying excellent behavior are necessary. As a result, the management of these firms has to investigate the problem of leadership and make certain that leaders serve their followers rather than being serviced by their followers.

Hypothesis 1 focuses on the relationship between leadership and employee engagement among engineers in selected Malaysian medical device manufacturing companies, taking into account the demographic factors such as age, education level, and work experience. The age distribution of the employees surveyed indicates that the majority of the workers fall within the 25-34 age range, followed by the 35-44 age range. The education level of the employees showed that the majority held a degree, followed by a diploma and a master's degree. When it comes to work experience, the largest population of workers had 5 to 9 years of experience, followed by those with 1 to 4 years of experience.

Based on this demographic data, it can be hypothesized that the relationship between leadership and employee engagement may vary depending on the demographic factors

such as age, education level, and work experience. For instance, younger employees may have different perceptions of effective leadership compared to older employees. Similarly, employees with different educational backgrounds may have varying expectations of their leaders. Furthermore, employees with longer work experience may have different levels of engagement compared to those who are relatively new to the organization. Therefore, it is important to take into account these demographic factors while studying the relationship between leadership and employee engagement among engineers in Malaysian medical device manufacturing companies.

The findings of this study can be used by Malaysian medical device manufacturing companies to better understand the relationship between leadership and employee engagement. Companies can use this information to design leadership training programs and improve leadership styles to enhance employee engagement among engineers. Additionally, companies can also develop initiatives to measure and monitor employee engagement levels and identify areas for improvement.

5.4. Training & Career Development and Employee Engagement

In the process of determining the answer to the second research question, a research hypothesis was developed and evaluated. According to this study's second hypothesis, there is a substantial association between training and career advancement and employee engagement among engineers working for selected medical device manufacturing companies in Malaysia. The results reveal a favourable and substantial association between training and career development and employee engagement, which is consistent with the findings of previous research. As was to be predicted, this finding implies a positive relationship (Barrick et al., 2015; Hernandez et al., 2017 ;

Mokhtarian & Panahi, 2020). As a result, Hypothesis 2 can be accepted. According to the findings of this study, employee engagement in selected Malaysian companies that manufacture medical devices is positively correlated with training and career development opportunities for engineers. Furthermore, the findings indicate that the administration and management of the companies should pay more attention to training and career development as it is one of the most essential independent variables that enhances employee engagement.

In selected Malaysian medical device manufacturing companies, there may be a positive relationship between training and career development and employee engagement. This is because such companies may have a strong focus on continuous learning and development, which can help to improve employee engagement. Employees who feel that their employers are invested in their growth and development are more likely to feel engaged in their work and committed to their organization.

The demographic information provided, particularly age and education level, may have an impact on this relationship. For example, younger employees (18-24 years and 25-34 years) may have different expectations and priorities in terms of training and career development compared to older employees (45-54 years and 55 and above). Similarly, employees with higher education levels (Masters and PhD) may have different expectations and preferences for training and career development compared to those with lower education levels (Diploma and Degree). Additionally, the distribution of work experience among the employees may also have an impact on the relationship between training and career development and employee engagement. For instance, employees with longer work experience may have already

received training and career development opportunities in the past and may be more focused on other factors that contribute to their engagement, such as compensation and work environment.

Therefore, in order to fully understand the relationship between training and career development and employee engagement, it is important to consider the demographic factors and work experience distribution of the employees in the selected Malaysian medical device manufacturing companies.

5.5. Compensation and Employee Engagement

To answer the third research question, a research hypothesis was developed and tested. Hypothesis 3 of this study suggests that there is a substantial connection between compensation and employee engagement among engineers in specific medical device manufacturing companies in Malaysia. As predicted, the findings showed a significant and positive relationship between compensation and employee engagement, which is in line with previous studies (Milkovich & Newman, 2019; Cascio, 2018; O'Boyle & Aguinis, 2020). Therefore, Hypothesis 3 is confirmed. This outcome implies that compensation and career development are significant factors influencing employee engagement among engineers in selected Malaysian medical device manufacturing companies.

Compensation can play a significant role in employee engagement for medical device companies, as it is a highly competitive industry that requires skilled and specialized talent. To attract and retain talented employees, medical device companies may offer competitive compensation packages that include base salary, bonuses, stock options,

health insurance, and other benefits. It is important for companies to ensure that their compensation policies are fair and equitable to all employees, regardless of their position or tenure. This can include providing competitive salaries and benefits packages, as well as offering opportunities for growth and development through training and career development programs. Moreover, it is essential for companies to communicate their compensation policies and programs effectively to employees. This can help to build trust and transparency, which are critical components of employee engagement. In conclusion, the relationship between compensation and employee engagement in selected Malaysian medical device companies is important to understand. By offering fair and competitive compensation packages and providing opportunities for growth and development, companies can foster a culture of engagement that benefits both employees and the organization as a whole.

Based on the given demographics, the majority of the workers have a work experience of between 5 and 9 years, which indicates that they are likely to be in the mid-career phase. This means that they may be looking for more opportunities for growth and development, which could include increased compensation as a form of recognition for their experience and expertise. Additionally, the education level of the sample population is relatively high, with the majority of workers holding a degree or higher qualification. This suggests that they may have higher expectations regarding compensation and benefits packages, as they are likely to be aware of industry standards and norms. Therefore, hypothesis 3 suggests that providing competitive compensation packages may be an important factor in promoting employee engagement among engineers in selected Malaysian medical device manufacturing

companies, particularly for mid-career employees with significant experience and qualifications.

5.6. Work Environment and Employee Engagement

Fourth hypothesis of this research indicated that a substantial relationship exists between employee engagement and the work environment. The conclusion can be sustained, with alignment from the findings of previous research (eg Anitha,2014; May et al., 2004).

Hypothesis 4 suggests that there is a significant relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies. The given demographics show that the majority of workers fall within the age range of 25-34 years, with a smaller percentage in the age ranges of 18-24 years and 35-44 years. Additionally, the majority of workers hold a degree level of education, with a smaller percentage holding a diploma or a master's degree. The largest population of workers has a work experience of between 5 and 9 years, followed by 1-4 years and then 10-14 years. This suggests that a significant portion of the workforce is relatively young and may be early in their careers. The older workers with more than 15 years of experience make up a small percentage of the workforce. Considering the hypothesis and the given demographics, it may be hypothesized that work environment factors such as workspace design, equipment and facilities, and overall office culture may have a greater impact on the engagement of younger workers who are earlier in their careers. These younger workers may be more impressionable and influenced by their surroundings, while older workers may have already formed their own work habits and attitudes towards

their work. This hypothesis can be further investigated through statistical analysis to determine the strength and direction of the relationship between work environment and employee engagement among engineers in selected Malaysian medical device manufacturing companies, taking into account the demographic factors of age and work experience.

5.7. Implications of the Study

The implications of studies that demonstrate the relationship between leadership, training, and career development, compensation and employee engagement in the medical device manufacturing industry are significant for organizations. Understanding what factors drive employee engagement can help companies to create a more engaged and productive workforce, which can have a positive impact on their bottom line.

Studies that demonstrate the significance of effective leadership and career development opportunities can lead organizations to invest in developing their leaders and providing opportunities for their employees to grow in their roles. For example, studies that demonstrate the importance of competitive compensation in driving employee engagement can encourage organizations to offer competitive salaries and benefits packages to attract and retain talented engineers.

Leaders who are able to provide clear direction and offer support to their team members can help to create a sense of trust and respect among employees. In addition, leaders who recognize and reward their employees' contributions can help to motivate and retain talented engineers. On the other hand, poor leadership that is unsupportive,

unclear, or unresponsive can lead to a negative work environment and decreased employee engagement. Therefore, it is important for medical device manufacturing companies to invest in developing effective leaders who can foster a positive work culture and drive employee engagement among engineers. By doing so, they can create a more engaged and productive workforce that is better equipped to drive innovation and growth.

Training and career development opportunities can have a significant impact on employee engagement among engineers in the medical device manufacturing industry. Engineers often require specialized technical skills and knowledge to perform their work effectively, and offering opportunities for training and development can help employees to grow in their roles and feel more engaged with their work. In addition, providing a clear career path and opportunities for advancement can help to motivate and retain talented engineers. Therefore, it is important for medical device manufacturing companies to provide training and career development opportunities for their engineering staff. By doing so, they can foster a culture of learning and growth that can lead to a more engaged and productive workforce.

Engineers often require specialized technical skills and knowledge, and offering competitive compensation packages that reflect the value of their work can help to attract and retain talented employees. In addition to base salary, companies may offer bonuses, stock options, and other benefits to incentivize and reward employees for their contributions. By offering a comprehensive compensation package, companies can create a sense of security and satisfaction among employees, which can lead to increased engagement and commitment. However, compensation alone may not be

enough to drive employee engagement. Other factors, such as opportunities for career growth, a positive work environment, and effective leadership, can also play an important role in fostering engagement among engineers in the medical device manufacturing industry. Therefore, it is important for companies to take a holistic approach to employee engagement and consider all of the factors that contribute to a positive and engaged workforce. By doing so, they can create a culture of engagement that supports their employees and drives success.

Overall, the implications of these studies can provide valuable insights and guidance for medical device manufacturing companies looking to improve their employee engagement and maximize their success. By taking a data-driven approach and understanding what factors drive employee engagement, organizations can create a more engaged and committed workforce that is better equipped to drive innovation and growth.

5.8. Recommendations

It is important to acknowledge the limitations of any study and to consider suggestions for future research. Some limitations of studies on employee engagement in the medical device manufacturing industry might include:

1. Sample size: Some studies may have a limited sample size, which could impact the generalizability of their findings.
2. Self-reported data: Studies that rely on self-reported data may be subject to bias and may not accurately reflect the actual levels of employee engagement.

3. Industry-specific factors: The medical device manufacturing industry may have unique factors that influence employee engagement, which may not be captured in broader studies.

To address these limitations and provide more comprehensive insights, future research might consider:

1. Larger sample sizes: Studies with larger sample sizes can provide more representative data and increase the reliability of the findings.
2. Multiple sources of data: Combining self-reported data with other sources of data, such as objective performance metrics, can provide a more complete picture of employee engagement.
3. Industry-specific studies: Conducting industry-specific studies can help to identify unique factors that influence employee engagement in the medical device manufacturing industry.

Overall, addressing these limitations and pursuing future research can help to further our understanding of employee engagement in the medical device manufacturing industry and guide organizations in creating a more engaged and productive workforce.

In conclusion, employee engagement is a critical factor for success in the medical device manufacturing industry. Studies have shown that compensation, leadership, training, and career development are all significant factors that can influence employee engagement among engineers in this industry.

Offering competitive compensation packages that reflect the value of employees' work, developing effective leaders who can foster a positive work culture, providing opportunities for career growth, and offering training and development programs can all help to create a more engaged and committed workforce. By doing so, organizations can drive innovation, improve productivity, and achieve their goals.

However, it is important to consider the limitations of existing studies and to pursue future research to gain a more comprehensive understanding of employee engagement in the medical device manufacturing industry. By addressing these limitations and continuing to explore the factors that drive employee engagement, organizations can create a culture of engagement that supports their employees and drives their success.



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Appendix A

Survey Questionnaire



SCHOOL OF BUSINESS MANAGEMENT

COLLEGE OF BUSINESS

UNIVERSITI UTARA MALAYSIA

Dear Sir / Madam:

It gives me great pleasure to let you know that I am in the process of carrying out a survey with the working title STUDY ON EMPLOYEE ENGAGEMENT AMONG ENGINEERS IN SELECTED MALAYSIAN MEDICAL DEVICE MANUFACTURING COMPANIES. I hope that you will participate in the survey. The purpose of this research is to investigate the levels of employee engagement at a number of Malaysian firms that manufacture medical devices. Hence, it would mean a great deal to me if you could answer each and every one of the survey's questions. The questionnaire may be completed in around half an hour's time. Please make sure you answer all of the questions and get the surveys back to us as soon as possible. Please be aware that your answer will not be made public and will be kept secret. The identities of particular responders will not be revealed in any of the resulting data or reports. I want to express my gratitude for taking the time to consider participating in this survey, as well as for your time and cooperation.

With heartfelt regards,

Lidia Stephen

MSc. (Management)

Universiti Utara Malaysia

Phone No. +60165193142

Email: lia712@outlook.com

Part A

Please select where apply.

1. What is your age?

18-24 years

☐

25-34 years

☐

35-44 years

☐

45-54 years

☐

55 years and above

☐

2. Highest education level:

SPM

☐

SPTM

☐

DIPLOMA

☐

DEGREE ☐

MASTER ☐

PHD ☐

3. Length of Employment

Less than 1 year ☐

1-4 years ☐

5-9 years ☐

10-14 years ☐

15-19 years ☐

20 years and above ☐

Part B

All of the surveys that were utilised had ratings based on a scale similar to the Likert scale, which meant that respondents simply needed to indicate their degree of agreement with the statements rather than having to write responses to the questions.

EE - Employee Engagement

LD - Leadership

TCD - Training & Career Development

CPN - Compensation

WE - Working Environment

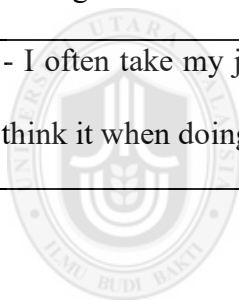


Part B

	1	2	3	4	5
<u>Employee Engagement</u>					
EE1 - I know what is expected of me at work					
EE2 - I have the materials and equipment I need to do my work right					
EE3 - At work, I have the opportunity to do what I do best everyday					
EE4 - In the last seven days, I have received recognition or praise for doing good work					
EE5 - My supervisor, or someone at work, seems to care about me as a person					
EE6 - There is someone at work who encourages my development					
EE7 - At work, my opinions seem to count					
EE8 - The mission or purpose of my company makes me feel my job is important					
EE9 - My associates or fellow employees are committed to doing quality work					
EE10 - I have a best friend at work					
EE11 - In the last six months, someone at work has talked to me about my progress					

EE12 - This last year, I have had opportunities at work to learn and grow					
<u>Leadership</u>					
LD1 - Supervisors in my work unit support employee development					
LD2 - My supervisor listens to what I have to say					
LD3 - My supervisor treats me with respect.					
LD4 - I have trust and confidence in my supervisor.					
LD5 - My immediate supervisor does a good job					
<u>Training & Career Development</u>					
TCD1 - My performance has improved as a result of the skills I have developed over the past years					
TCD2 - There are opportunities for me to develop my career					
TCD3 - Training and development I have received is helping me to develop my career					
TCD4 - My work gives me a sense of personal accomplishment					
TCD5 - I have training and development plan					
<u>Compensation</u>					
CPN1 - I'm satisfied with the consistency of the company's pay policies					
CPN2 - I'm satisfied with my take home pay					
CPN3 - I'm satisfied with my benefit package					

CPN4 - I'm satisfied with the recent increase in my salary					
CPN5 - I'm satisfied with my overall pay structure					
<u>Work Environment</u>					
WE1 - My work area is sufficiently equipped for my typical needs (normal, storage, movements, etc).					
WE2 - My job tends to directly affect my health.					
WE3 - If had a different job, my health would probably improve.					
WE4 - Problems associated with my job have kept me awake at night.					
WE5 - I often take my job home with me in the sense that I think it when doing other things.					



Appendix B

SPSS Output

1. Demographic Profiles of Respondents

Characteristic of age

Age	Frequency	Percentage (%)
18-24 years	31	17.8
25-34 years	77	44.3
35-44 years	51	29.3
45-54 years	11	6.3
55 and above	4	2.3
Total	174	100

Characteristic of education level

Education Level	Frequency	Percentage (%)
Diploma	35	20.1
Degree	109	62.6
Masters	25	14.4
PhD	5	2.9
Total	174	100

Characteristic of length of employment

Employee	Frequency	Percentage (%)
Less than 1 year	4	2.3
1 to 4 years	48	27.6
5 to 9 years	95	54.6
10 to 14 years	15	8.5
15 to 19 years	8	4.6
20 years and above	4	2.3
Total	174	100

2. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
EE	174	1.00	5.00	3.5176	.89821
LD	174	1.00	5.00	3.5658	.93518
TCD	174	1.00	4.80	3.5592	.87791
CPN	174	1.00	5.00	3.5780	.92403
WE	174	1.20	4.80	3.3147	.97783
Valid N (listwise)	174				

3. Pearson's Correlation

Correlations			
		EE	LD
EE	Pearson Correlation	1	.914**
	Sig. (2-tailed)		<.001
	N	174	174
LD	Pearson Correlation	.914**	1
	Sig. (2-tailed)	<.001	
	N	174	174

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations

		EE	TCD
EE	Pearson Correlation	1	.891**
	Sig. (2-tailed)		<.001
	N	174	174
TCD	Pearson Correlation	.891**	1
	Sig. (2-tailed)	<.001	
	N	174	174

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations

		EE	CPN
EE	Pearson Correlation	1	.910**
	Sig. (2-tailed)		<.001
	N	174	174
CPN	Pearson Correlation	.910**	1
	Sig. (2-tailed)	<.001	
	N	174	174

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations

		EE	WE
EE	Pearson Correlation	1	.737**
	Sig. (2-tailed)		<.001
	N	174	174
WE	Pearson Correlation	.737**	1
	Sig. (2-tailed)	<.001	
	N	174	174

** . Correlation is significant at the 0.01 level (2-tailed).

4. Model of Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.945 ^a	.892	.890	.29836

a. Predictors: (Constant), WE, TCD, LD, CPN



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