CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter outlines the research philosophy, research design, population and sample, data collection method and procedures, research measurement, and data analysis procedure.

3.2 Research Philosophy

3.2.1 Epistemology

The study of knowledge is also known as epistemology. It answers the questions of how we know and what we know. Epistemology is concerned with the claims that what is assumed to happen can be understood. Interpretivism and positivism are examples of epistemological positions (Collis & Hussey, 2013).

3.2.1.1 Interpretivism

The purpose of an interpretive explanation is to encourage understanding. The interpretive theorist tries to discover the meaning of an event or practice by placing it within a specific social context. The researcher tries to appreciate or believes the operation of the social world, as well as get a sense of or to see the world as another person does (Neuman, 2007). Also, interpretive inquiry uses qualitative and naturalistic approaches to inductively and holistically understand human experience in context-specific settings.

The interpretivism paradigm also refers to how we as humans, make sense of the world around us (Saunders et al., 2012). The interpretive notion contends that science is an ongoing social process and that the full epistemic understanding of scientific theories can only be achieved through observation of the dynamics of theory development. Nonetheless, interpretive philosophy is based on the belief that science is subjective and allows alternative models of reality (Easterby-Smith et al., 2012).

3.2.1.2 Positivism

Positivism remains the dominant paradigm in business research, as in other social science fields. The selection of the positivist approach ought to be based on the nature of the problem addressed and previous literature in a similar domain.

Positivism is an epistemological position that advocates applying the methods to observable social reality and beyond (Bryman & Bell, 2011; Saunders et al., 2012). This paradigm also believes that the only reliable knowledge is based on sense, facts, and positive justification (Bryman & Bell, 2011; Creswell, 2009). It recommends that the real world is objective and there is a relationship between the world and our understanding and perception of it. Positivism is regarded as a one-way mirror of inquiry in which researchers and researched objects are presumed to be independent entities; in other words, there is no influence from either side (Guba & Lincoln, 1994). Positivism assumes that all phenomena, whether physical, natural, social, or psychological, exhibit persistent rhythms or regularities that can be studied. It belongs to the school of thought that predominantly advocates value-free (i.e., objective) natural sciences methods to study social reality and beyond (Bryman & Bell, 2011). Positivism refers to a set of epistemological perspectives

and philosophies of science that hold the scientific method as the best approach to uncovering the processes by which physical and human events occur. According to logical positivism, there are only two sources of knowledge: logical reasoning and empirical experience (Easterby-Smith et al., 2012).

Based on the previous discussion, the basic concept of positivism is that the social world exists externally. Therefore, its properties should be examined and measured through objective methods rather than being inferred subjectively through reflection, sensation, or intuition. Positivism advocates the belief that scientific research starts with hypotheses and is tested to prove if they are supported or not. It is known as the hypothetico-deductive model (Collis & Hussey, 2013). Positivist researchers look for what has caused a particular relationship or phenomenon and what are the effects of this relationship or phenomenon. They favour quantitative data, which can be easily turned into numbers and statistics. Hence, they prefer using official statistics, structured interviews, and questionnaires with closed-ended questions. The theory and practice correlation in the positivist philosophy are mostly technical. Positivists generally believe that scientific inquiry is value-free and that researchers are neutral observers of phenomena. In general, positivists believe in the empirical testability of theories and that data provide objective, independent benchmarks for examining theories (Creswell, 2018).

In summary, the positivist approach examines reasoning using a deductive process (Hirschheim & Klein, 1992). The following outline briefly illustrates its characteristics: a) the formulation of hypotheses, models, or assumptions of causal relationships among constructs; b) the probable use of quantitative methods to test relationships; c) the researcher's value-free interpretation objective (Chen & Hirschheim, 2004). The positivist

approach can clearly distinguish objective and subjective data interpretation (McKenzie et al., 1997). This paradigm enables social phenomena to be scientifically observed and measured, and it is claimed that the collected data has the merit of reliability. Moreover, such an approach of collecting data and statistical results have been characterised as unbiased or value-free. Therefore, the positivist paradigm is appropriate and was adopted in this study.

3.2.2 Research Approach

A research approach focuses on how the research project will interact with the use of theory or theories (Collis & Hussey, 2013; Creswell, 2018; Saunders et al., 2012). A literature review identifies two main research approaches, deductive and inductive.

The inductive approach is usually described as moving from the specific to the general. Thus, discussions based on experience or observations are best expressed inductively, beginning with observation and cases and progressing to theory. According to Collis & Hussey (2003), inductive research is the study in which theory is developed from observing empirical reality. In this approach, the researcher collects the primary data through interviews or other means of observation. After data analysis, the researcher presumably will be able to build a theory initially; it is a theory-developing approach. The qualitative strategy uses methods to derive hypotheses and develop theories by emphasising description and understanding of the situations behind the factors (Creswell, 2018; Klein & Myers, 1999). Qualitative studies tend to be associated with the inductive approach due to its flexibility, where the researcher can interact and engage with the respondents and discuss with them issues that are of importance to the researcher, the organisation, or the

society, for the researcher to investigate and interpret them for the rationale of research results. The inductive approach is more flexible than the deductive approach due to the latter's characteristic of employing a rigid methodology that would not allow alternative explanations or interpretations of the phenomena (Saunders et al., 2012).

In contrast, the deductive approach is known as testing a theory. A deductive research approach allows the researcher to establish a hypothesis using theory or theories (Gill & Johnson, 2010). Deductive research begins with the general and ends with the specific. Therefore, arguments based on laws, rules, or other widely accepted principles are best expressed deductively. The deductive approach has been defined as an approach to data analysis, explanation, and theory that sees empirical social research as conducted based on a hypothesis derived from a social theory which is then tested against empirical observation and subsequently used to confirm or refute the original theoretical proposition (Miller & Brewer, 2003). Such an approach has some predominant characteristics. For example, it aims to explain the causal relationships between variables, it collects quantifiable data, and its results can be generalizable (Saunders et al., 2012). It is also a fixed and rigid design. It seeks to understand the facts or causes of phenomena. It does not regard the subjective states of a situation or individuals, as scientific research principles should be applied to all phenomena that are the focus of the investigation. In other words, it does not account for the subjective nature of the researcher's decisions made throughout the stages of the research process (Onwuegbuzie & Leech, 2005). It relies on instruments and procedures, which could hinder the connection between research and daily life, as it holds reality independent of personal experience (Gall et al., 2006). The analysis of

relationships between variables creates a static view of social life independent of people's lives (Bryman & Bell, 2011).

Based on the discussion, the deductive approach is appropriate to be choosen and implemented in this study.

3.3 Research Design

According to Creswell (2018), a research design is a blueprint or a document that the researcher has to produce to enable ease in collecting data, measuring, and performing data analysis to answer the research objectives and questions. A research design provides the framework to be used as a guide in collecting and analysing data. In addition, a research design is a plan for the study that provides the specification of the procedure to be followed by researchers to accomplish their research objectives or test the hypothesis formulated for the study.

The quantitative research methodology is adopted for this study. The quantitative method entails collecting primary data from a large number of individuals to present the outcome to a large population (Coldwell & Herbst 2004). In addition, the strength of the quantitative method is that it emphasises testing and verification, is result-oriented, particularistic and analytical, and focuses on facts (Ghauri & Gronhaug, 2002). Moreover, the quantitative method can provide a summary of information for several characteristics. This method is highly accurate regarding representativeness (Joseph et al., 2003).

The quantitative method includes experimental and survey designs (Creswell, 2018). An experimental design systematically manipulates one or more variables to evaluate how this manipulation impacts an outcome (or outcomes) of interest. A survey

design provides a quantitative description of trends, attitudes and opinions of a population or tests for associations among a population's variables by studying a population sample.

This study can be classified as a survey strategy study. A survey can be defined as a research technique in which information is gathered from a sample of people through a questionnaire or interview (Zikmund, 2003). Saunders & colleagues (2012) and Zikmund & colleagues (2012) mentioned that low cost, time-saving, efficient and accurate means of assessing information about the targeted population, and standardisation are predominant attributes of survey studies. In addition, survey designs help researchers answer three types of questions: (a) descriptive questions, (b) questions about the relationships between variables or in cases where a survey design is repeated over time in a longitudinal study, and (c) questions about predictive relationships between variables over time (Teddlie & Tashakkori, 2009; Cresswell, 2018).

This study applied a quantitative methodology with a non-experimental cross-sectional survey design (with the data collected at one point in time). This type of design is appropriate as the quantitative method is often used to classify and enumerate data that can result in statistical models built from scientific precision (Babin et al., 2013). Additionally, a quantitative non-experimental approach allows the results to be generalised to a larger population.

3.4 Population and Sample

Choosing the research population is very important because part of that population is the research sample, which is the source of data that the researcher requires for the research findings.

3.4.1 Study Population

The first stage in the sampling process is clearly defining the target population. Monique, Hutter and Bailey (2011) noted that it is important to clearly define the target population before deciding on a research strategy. According to Sekaran and Bougie (2016), the population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate. It is the group of people, events, or things of interest for which the researcher wants to make inferences (based on sample statistics). A population also is a target group of researchers so that some research findings can be applied. Besides, the population refers to the entire group of people, events, or matters that interest researchers to investigate (Berawi, 2017).

The population of this study are the full-time academic staff at the Islamic university colleges in Malaysia that participated in SETARA 2019 and achieved tier four (4) (competitive) and tier three (3) (moderately competitive). Based on Table 3.1, there are three Islamic university colleges in Malaysia that participated in SETARA 2019 and achieved tier four (4) (competitive) and tier three (3) (moderately competitive), namely as Kolej Universiti Islam Antarabangsa Selangor (KUIS), Kolej Universiti Islam Melaka (KUIM) and Kolej Universiti Islam Perlis (KUIPs). Although these three Islamic university colleges achieved tier four and tier three in SETARA 2019, past studies showed that the level of job performance among academic staff at this context are still at moderate level (Tengah et al., 2022; Mesran & Jakaria, 2019).

Based on Table 3.1, the total population for this study is 597 academic staff members. 340 academic staff members are from Kolej Universiti Islam Antarabangsa

Selangor (KUIS). 188 academic staff members from Kolej Universiti Islam Melaka (KUIM). 69 academic staff members from Kolej Universiti Islam Perlis (KUIPs).

Table 3.1: Total Number of Academic Staff

Selected University Colleges	Total Population of Academic Staff
Kolej Universiti Islam Antarabangsa Selangor (KUIS)	340
Kolej Universiti Islam Melaka (KUIM)	188
Kolej Universiti Islam Perlis (KUIPs)	69
Total	**597**

3.4.2 Sample

A sample is a subset or subgroup of the population. It comprises some members selected from it. By studying the sample, the researcher should be able to draw generalizable conclusions about the population of interest (Sekaran & Bougie, 2016).

3.4.2.1 Sampling Technique

There are two major types of sampling design: probability and non-probability sampling. In probability sampling, the elements in the population have some known, non-zero chance or probability of being selected as sample subjects. While, in non-probability sampling, the elements do not have a known or predetermined chance of being selected as subjects (Sekaran & Bougie, 2016).

This study has applied the probability sampling designs. In specific, this study used the stratified sampling technique. According to Sekaran & Bougie (2013), this sampling

technique refers to a procedure of sampling in which the researcher separates the whole population of the study into distinctive stratum and afterwards randomly selects a subject from every stratum.

Stratified sampling techniques are able to minimise the sampling errors. The stratified sampling technique also allows homogeneity within the stratum and heterogeneity across groups (Meng, 2013; Tabiu et al., 2016). In addition, this type of sampling technique enables every academic staff member at the selected Islamic university colleges to have an equal chance of being selected in the sample (Sekaran & Bougie, 2016).

3.4.2.2 Sample Size

Table 3.2 explains selection of sample from each stratum (the selected Islamic University Colleges). Based on the total population of academic staff, 57 percent of respondents are from Kolej Universiti Islam Antarabangsa Selangor (KUIS), 31 percent of respondents are from Kolej Universiti Islam Melaka (KUIM), and another 12 percent of respondents are from Kolej Universiti Islam Perlis (KUIPs). The minimum sample size for this study are 234 respondents. The minimum sample size is determined based on Table Krejcie and Morgan (1970), as shown in Table 3.3. However, this study distributes the questionnaire to 260 respondents to avoid the issue of low return rate an incomplete responses.

Table 3.2: The Proportionate Stratified Sampling of Respondents

Selected Islamic University Colleges	Total Population of Academic Staff	Stratum (%)	Sample (Based on Krejie and Morgan, 1970)
Kolej Universiti Islam Antarabangsa Selangor (KUIS)	340	57% (340/597)	133 (234 x 0.57)
Kolej Universiti Islam Melaka (KUIM)	188	31% (188/597)	73 (234 x 0.31)
Kolej Universiti Islam Perlis (KUIPs)	69	12% (69/597)	28 (234 x 0.12)
Total	**597**	**100%**	**234**

Table 3.3: Table to Determining Sample Size

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

Source: Krejic Morgan (1970)

3.5 Questionnaire Design

Respondents were asked to rate their answers on a Likert scale by selected instruments. The scales used to measure the variables for this study are adapted from the existing scales developed by past researchers. The survey items are subject to reliability analysis. A coefficient exceeding 0.70 is generally considered acceptable in social science (Nunnally & Bernstein, 1994). In addition, there are nine questions related to respondents' demography. The following sections will provide a detailed discussion of the questionnaire.

3.5.1 Demographic

Section A is the demographic data of respondents. This section solicits general information from the respondents, which includes: age, gender, marital status, position, level of education, salary, and length of service. The demographic questions are determined in Table 3.4 below:

Table 3.4: Demographic Questions for Research Participants

Questions	Purpose
Gender	It is to identify the sex of the respondent and to find out the number of males and females.
Nationality	It was to identify the country of origin of the respondent.
Age	To state their current age.
Marital Status	To define if they are single/ married.
Education Level	To define their highest level of education: Bachelor's degree, Master's degree, PhD or any other.
Position	To find out the respondent's position in the organisation.
Position Status	To find out the position status of the respondent.
Salary	To state their current range of the salary
Length of Service	To find out how long the respondent has been working in the organisation.

3.5.2 Academic Staff Performance

Section B includes the questions related to academic staff performance adapted from Mawoli & Babandako (2011). There are three (3) dimensions in measuring academic staff performance: teaching, research and publication performance. The questionnaire consists of 22 items, using a 5-point Likert scale (1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree, and 5= Strongly Agree). The items are shown in Table 3.5. The measurement has been used in previous studies by Mawoli & Babandako (2011), Abdulsalam & Mawoli (2012), Akhtar & Iqbal (2017), and Tengah et al. (2022).

Table 3.5: The Items for Academic Staff Job Performance

Dimension	Items	No. of Items
Teaching Performance	1. I attend my lesson according to the timetable. 2. I attend my lessons always. 3. I enter my class at the right time (i.e., not late). 4. I leave my class at the right time (i.e., not earlier than supposed). 5. I give notes to my students. 6. I give a test, assignment and field/practical work to the students in every course I teach. 7. I mark all the assignments given to students. 8. I return all continuous assessment (CA) marked scripts to students. 9. I release the CA scores to students before the examination commences. 10. I read and correct students' projects.	**10**
Research Performance	11. I attend at least one national conference per annum. 12. I attend at least one international conference every three (3) years. 13. My conference papers are published in the conference proceedings 14. I publish my research articles with a university. 15. My research articles have been published in a foreign journal. 16. I have participated in sponsored national research. 17. My research articles have been published in a newspaper/magazine. 18. I have participated in sponsored international research.	**8**

Publication Performance	19. I have authored a book (s). 20. I have co-authored a book(s). 21. I have contributed chapters to the Book of Readings. 22. I have contributed chapters to an edited book.	**4**
	Total	**22**

3.5.3 HRM Practices

Section C includes questions related to HRM practices. The instrument was developed and validated by Presbitero and colleagues (2016), encompassing 13 items. The instrument consists of 4 dimensions; remuneration and reward, training and development, career development opportunities, and employee well-being. Survey respondents indicated, on a range from one (1) to five (5) point Likert Scale from 1=Strongly Disagree to 5= Strongly Disagree, the extent to which each item describes the HRM practice implemented in their organisation. The details regarding the item are shown in Table 3.6 below:

Table 3.6: The Items for HRM Practices

Dimension	Items	No. of Items
Remuneration and Rewards	1. The rewards and recognition I receive from this job are attractive. 2. The remuneration and reward are fair. 3. I am satisfied with the income I receive. 4. I am satisfied with the benefits I receive (e.g., leave, allowances etc.).	**4**
Training and Development	5. When people start new jobs in this organisation, they are given enough guidance and training. 6. This organisation gives a commitment to ongoing training and development of the staff. 7. The training and development I have received have improved my performance.	**3**
Career Development Opportunities	8. Enough time and effort are spent on career planning. 9. I'am given opportunities for my career to progress in this organisation.	**3**

	10. There are enough opportunities for my career to progress in this organisation.	
Work-life Balance	11. I can have a good balance between work and other activities. 12. I can be involved in both work and non-work-related activities. 13. My work allows me to have time for social activities outside work.	**3**
	Total	**13**

3.5.4 Leader-member Exchange (LMX)

Section C is the LMX survey. The LMX scale by Graen and Uhl-Bien (1995) is employed to measure the quality of exchange between supervisors and subordinates. There are seven items. Survey respondents indicated, on a range from one (1) to seven (7) point Likert Scale from 1= Strongly Disagree, 2= Disagree, 3= More or Less Disagree, 4= Neutral (Undecided), 5= More or Less Agree, 6= Agree and 7= Strongly Agree. The details regarding the item are shown in Table 3.7 below:

Table 3.7: The Items for LMX

No.	Items	No. of Items
1.	When I really need it, I can count on my manager to 'bail me out' even at his own expense.	**7**
2.	My manager understands my problems and needs.	
3.	My manager recognizes my potential.	
4.	I know where I stand with my manager.	
5.	My manager has enough confidence in me that he/she would defend and justify my decisions if I were not present to do so.	

6.	My working relationship with my manager is effective.	
7.	Regardless of how much power the manager has built into his or her position, my manager would personally be inclined to use his/her power to help me solve problems in my work.	
	Total	**7**

3.5.5 Work Engagement

Section C is the survey measures of work engagement adapted from Schaufeli and colleagues (2006) that encompass nine items. Survey respondents indicated, on a range from zero (0) to six (6) point Likert Scale from 0= Never, 1=Almost Never (A few times a year or less), 2= Rarely (Once a month or less), 3= Sometimes (A few times a month), 4= Often (Once a week), 5= Very Often (A few times a week), and 6= Always (Every day). The details items for work engagement are as follows (see Table 3.8):

Table 3.8: The Items for Work Engagement

Dimension	Items	No. of Items
Vigour	1. At my work, I feel bursting with energy. 2. At my job, I feel strong and vigourous. 3. When I get up in the morning, I feel like going to work.	**3**
Dedication	4. I am enthusiastic about my job. 5. My job inspires me. 6. I am proud of the work that I do.	**3**
Absorption	7. I feel happy when I am working intensely. 8. I am immersed in my work. 9. I get carried away when I am working.	**3**
	Total	**9**

3.5.6 Personality

The Big Five personality by Sawyer and colleagues (2009) is employed to measure the personality traits of academic staff. There are 21 items to be measured. Sawyer et al. (2009) measured conscientiousness using five items, the rest using four items each. Each scale demonstrated reasonable reliability; 0.87, 0.91, 0.81, 0.88, and 0.86, respectively, for conscientiousness, agreeableness, emotional stability, extraversion/introversion, and openness to new experience. These are similar to those obtained by Goldberg (1999): 0.81, 0.85, 0.81, 0.88, and 0.79, respectively, for conscientiousness, agreeableness, emotional stability, extraversion/introversion, and openness to new experiences. Survey respondents indicated, on a range from one (1) to seven (7) point Likert Scale from 1= Strongly Disagree, 2= Disagree, 3= More or Less Disagree, 4= Neutral (Undecided), 5= More or Less Agree, 6= Agree and 7= Strongly Agree. The details regarding the item are shown in Table 3.9 below:

Table 3.9: The Items for Personality

Dimension	Items	No.of Items
Conscientiousness	1. I am always prepared. 2. I pay attention to details. 3. I get chores done right away. 4. I like order. 5. I follow a schedule.	**5**
Extraversion	1. I feel comfortable around people. 2. I start conversations. 3. I talk to a lot of different people at parties. 4. I do not mind being the centre of attention	**4**

Agreeableness	1. I sympathise with others' feelings. 2. I have a soft heart. 3. I take time out for others. 4. I feel others' emotions.	**4**
Neuroticism	1. I seldom feel blue. 2. I feel comfortable with myself. 3. I readily overcome setbacks. 4. I am relaxed most of the time.	**4**
Openness	1. I have a rich vocabulary. 2. I have a vivid imagination. 3. I have excellent ideas. 4. I am full of ideas.	**4**
	Total	**21**

3.6 Data Collection Procedures

The data of this study were collected through a questionnaire. According to Bell (2005) and Zikmund (2003), the questionnaire is a suitable instrument for gathering data in social science. In addition, the questionnaire has been recognized as an effective tool for collecting research data from a large sample size at a low cost (Saunders et al., 2012). Moreover, this method can be administered to many people simultaneously in one setting. The study was conducted in selected Islamic University Colleges in Malaysia. Therefore, the questionnaires were presented in both English and Malay to avoid language limitations and misunderstandings of the questions.

Before the questionnaire was distributed to the respondents, an initial call was made to obtain permission to conduct the study among the academic staff from the selected Islamic College University's management by submitting a letter describing the purpose of the study, as well as a description of the survey, and the methods of data collection.

There was a cover letter in front of the questionnaire. A covering letter is significant in introducing a research survey to participants (Czaja & Blair, 1996). The cover letter presented respondents about the research, the aim of the study, and its significance. It also highlights the issue of confidentiality and the respondent's freedom to withdraw consent at any time. Finally, the cover letter provides details on how to communicate with the researcher for any further inquiries. As indicated by Churchill (2001), the questionnaire layout should look professional and easy to answer. It is because an unprofessional-looking design might reduce the study's response rate. Each section starts with a topic heading to make participants aware of the objective of each section.

According to Bryman and Bell (2003), a questionnaire can be mailed or posted or handed out to respondents by the researcher. In this study, the questionnaires were distributed to the respondents using an online platform (google form) due to the restriction of the movement control order by the government of Malaysia. The questionnaires were sent to respondents via email and WhatsApp application. The feedback from the respondents have been monitored frequently. A frequent reminder also has been sent through email and WhatsApp Application for those respondents who have not yet provide feedback to the questionnaire to ensure the selected sample fulfils the questionnaire. Another initiative to increase the feedback is through in-person distribution. This effort is taken to make sure the respondents understand the purpose of the research and give them an adequate explanation about the research to encourage them to complete the questionnaire.

For confidentiality considerations to protect the participants in this research, this study applies three codes of behaviour proposed by Bell (2005). First, the respondents'

identity is not revealed in the research report. Second, the respondents have been provided with a copy of the research protocol explaining their contribution and how the research findings would benefit the Islamic University Colleges. Third, this study has assured the respondents that any discussion of individual cases would remain confidential to the researcher.

3.6.1 Pre-Test

The importance of questionnaire design in any research project cannot be overstated. Many of the existing studies emphasised that the two primary goals of questionnaire design are to: first, provide the opportunity to gather the targeted respondents' numbers; and second, assist in avoiding and reducing likely measurement error by methodically arranging the questions in a way that will make them understandable to respondents (Clark, 1989). Prior to completing the actual survey, a preliminary questionnaire was created for pre-testing. This involved requesting experts to read and review the questionnaire in order to check for any inconsistencies that the researcher may not have discovered. In order to accomplish the study's intended goal, the expert has been engaged in order to get his opinion based on his expertise. He is Dr. Shah Rollah bin Abdul Wahab, Senior Lecturer, School of Psychology and Human Resource Development, Faculty of Science and Humanity, Universiti Teknologi Malaysia, Skudai, Johor.

3.6.2 Pilot Study

A pilot study was conducted before the actual data collection to confirm the validity and reliability of the instrument of this study. A pilot study can be defined as using a small

sample of data as a trial to test the suitability of something else (Sekaran & Bougie, 2013). It will help in clarifying any likely shortfalls and decreases unfairness. The present study used a questionnaire to serve as the primary data source. Therefore, the desire to do validity and reliability tests became important (Hair et al., 2007). In this regard, the questions' validity and reliability were established to determine if the question items could measure the variables intended (Hair et al., 2012).

There are 30 respondents involved in the pilot test. Table 3.10 indicates the reliability analysis for all the constructs and values obtained, to find out whether or not they meet and are above the critical value of 0.7 as recommended by many scholars (Hair et al., 2011).

Table 3.10: Table of Reliability Analysis

No.	Item	No. of Item	Cronbach's Alpha
1.	Job Performance	22	0.807
2.	HRM Practices	13	0.830
3.	LMX	7	0.925
4.	Work Engagement	9	0.941
5.	Personality	21	0.867

3.7 Data Analysis Strategy

This subsection discusses the statistical analysis procedures to evaluate the survey data in answering the research question. This study, therefore, uses the Statistical Package for Social Sciences (SPSS) version 25 based on the procedure proposed by Hair et al. (1998)

to analyse the preliminary data analysis. In testing the hypothesised relationship among the constructs in the proposed model, this study employed Structural Equation Modelling (SEM)- Amos version 22.

3.7.1 Preliminary Analysis

Before undertaking any specific statistical techniques, the data sets were analysed to ensure the quality of the survey data collected. A preliminary analysis was conducted to identify the missing values, assessment of outliers and data distribution (Tabachnick & Fidell, 2007).

Data missing value has become a serious source of concern and may have grown popular in almost every study. The number of data missing in a study varies, as does the degree of its impact. For example, if it's less than 1%, it's not a concern; if it's less than 5%, it's acceptable and manageable, if it's more than 15%, it requires drastic measures and advanced procedures to fix it (Acuna & Rodriguez, 2004).

The outliers were assessed with Mahalanobis distance value. According to this method, when the value of Mahalanobis distance exceeds the critical value of chi-square, the case is considered an outlier (Hair et al., 1998).

The data distribution refers to normality of data. An assessment of the normality of data is a prerequisite for many statistical tests. Therefore, to choose the right statistical analysis, it is important to examine whether the data set is normally distributed. In this study, the assessment of skewness value of 1.0 or lower indicates the data was normally disseminated. However, if the sample size is greater than 200, skewness value up to 1.5 still indicates the data was normally disseminated (Hair et al., 2010). In addition, the data

was normally disseminated when Critical Region (CR) for the skewness does not exceed 8.0.

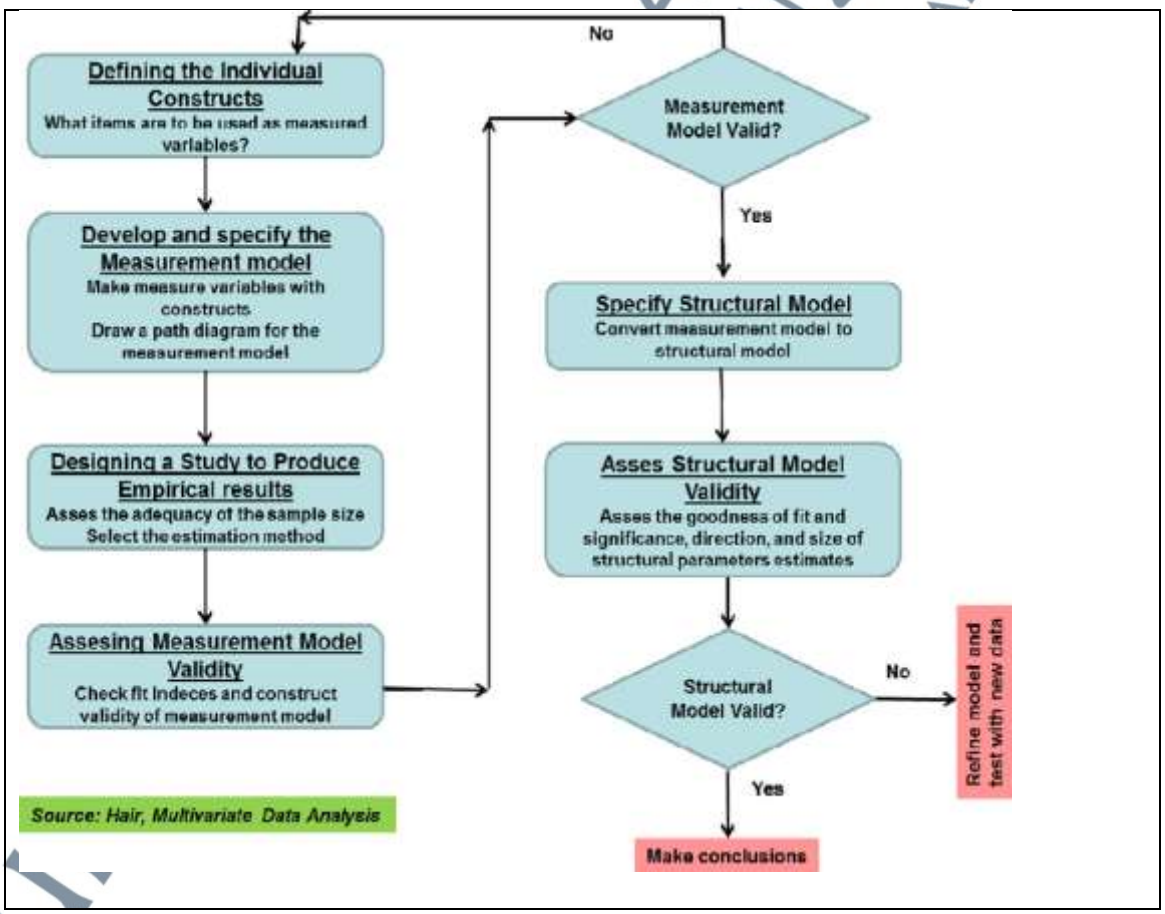
3.7.2 Descriptive Statistic

Descriptive statistics is all about summarising or describing or summarising the important characteristics of the data, and it allows the researcher to describe a wide range of data elements effectively. The present study used SPSS version 25 to analyse the data descriptively, following several steps and stages in determining the constructs' percentages, frequencies, means, ranges, and standard deviations. SPSS was also employed to obtain descriptive statistics (mean, standard deviation) on each variable under the study. In addition, descriptive statistics were also carried out to describe the demographic details of respondents in this study.

3.7.3 AMOS- SEM Analysis

The study used Smart SEM-Amos version 22. It is a second-generation statistical tool that allows researchers to analyse multiple concurrent variables. SEM provides a conceptually engaging way to test a theory in which a researcher can test precise theory regarding relationships among variables and latent constructs. The data was then represented, and SEM proved how good the theory fits. It became an important tool for data analysis due to its ability to handle complex models that can be estimated simultaneously (Hair et al., 2010). SEM enables an accurate result after SEM has analysed each latent variable and relationship simultaneously without measurement error (Nachtigall et al., 2003). That is to be said, all-important values such as regression estimates,

covariance, correlation, coefficient of multiple determinant and item factor loading are estimated simultaneously. SEM allows testing several equations simultaneously rather than for only one layer relationship between independent and dependent variables. SEM is based on the assumption of causal relationships where the variable in one regression equation in an SEM may appear as a predictor in another equation. Indeed, SEM is an essential analytical approach in management research (Williams et al., 2009). Therefore, SEM is often referred to as causal modelling, causal analysis, simultaneous equation modelling, analysis of covariance structures, path analysis, or confirmatory factor analysis



Source: Hair et al. (2010)

Figure 3.1: Six -Stage process for Structural Equation Modelling

This study applied the six-step decision-making process (Figure 3.1) suggested by Hair et al. (2010). This process varies slightly to reflect the unique terminology and procedure of SEM. The six stages are as follows:

Stage 1: Defining the Individual Constructs

As discussed in this chapter, the six survey measures used in this study were based on reliable and valid measures previously used and reported in the literature.

1. Job performance measures the respondent perception of teaching, research, and publication performance using 22 items developed by Mawoli & Babandako (2011).
2. HRM practices measure the respondents' perception of human resources management practices in HEIs, categorised by remuneration and rewards, training and development, career opportunity development and work-life balance, using 13 items by Presbitero and colleagues (2016).
3. LMX measures the respondents' perception to measure the quality of exchange between supervisors and subordinates, using seven items adapted from Graen and Uhl-Bien (1995).
4. Work engagement measures the respondents' perception characterised by vigour, dedication, and absorption adapted from Schaufeli and colleagues (2006), which encompasses nine items.
5. Personality measures the respondents' perceptions of extraversion, agreeableness, conscientiousness, neuroticism, and openness, adapted from Sawyer and colleagues (2009) with 22 items.

Stage 2: Develop and Specify Measurement Model.

SEM models are represented in graphical form, also called path diagrams, using arrows. Many researchers find it more convenient to depict the relationship between dependent and independent variables in a graphic way (Hair et al., 2010; Ullman, 2006). Path diagrams are like a device showing which variables can cause other variables. However, when a causation relationship does not exist, such diagrams can also be interpreted as a visual representation of the linear regression equation between the variables (Nachtigall et al., 2003).

This study assessed the first model construct in developing and specifying the measurement model. It is to verify the relationship between the indicators of the different constructs (Hair et al., 2010). In the second step, all constructs were pooled and assessed together because pool measurement is more efficient and can avoid the model identification problem (Awang, 2018). All constructs are pooled together and linked using double-headed arrows to assess the correlation among the constructs. The assumptions are important to test because any violation of these assumptions could affect the validity of the result (Schreiber et al., 2006)

Stage 3: Designing a study for empirical procedure results

After the measurement model is accepted, the next step is modelling the structural model. The structural model deals with the relationship among the latent variables (Hair et al., 2010). Accordingly, it specifies which particular latent variables directly or indirectly influence changes in the value of other latent variables in the model (Bryne & Barbara, 2010)

The structural model aims to test the research hypotheses conceptualised in this study. Similar to measurement model analysis, the structural analysis was tested for model fit to evaluate the full structural model. This test was based on the same criteria and cut-off value used in assessing the measurement model. Having fulfilled the goodness-of-fit indices, the *r-squared* was examined to describe the proportion of variance that was explained by the exogenous construct in the conceptual model. Analysis of each construct was also examined to see the effect of individual exogenous variables on the endogenous variable.

Stage 4: Assessing measurement model validity

SEM is a confirmatory method providing a comprehensive means for validating the measurement model of latent constructs, and it is called Confirmatory Factor Analysis (CFA). The CFA method can assess the latent construct's unidimensionality, validity, and reliability. Unidimensionality valuation should be made first before determining validity and reliability. In assessing unidimensionality, CFA was conducted to test how well a construct is measured by its indicators. In the second stage, each latent construct (job performance, HRM practices, LMX, work engagement, and personality) was tested in one measurement model: the Pool-CFA. The valuation for each element is done as follows:

1. Unidimensionality.

Unidimensionality was reached when all measurement items had acceptable factor loadings for the respective latent construct. In the measurement model, it must ensure unidimensionality. In using CFA, items with low factor loading should be removed from the scale because these items can cause the measurement model for the construct to be poorly fit. According to Hair et al. (2010), a factor loading of 0.5 and above is acceptable;

thus, the threshold value of 0.5 is used in this study. Thereafter, an estimation of the new measured value is obtained to see whether the fitness indices would be improved. The deletion should be made one at a time, with the lowest factor loading item to delete first. After an item is deleted, the researcher needs to run the new measurement model. The process continues until the unidimensionality requirement is achieved and also requires all factor loading to be positive or in one direction. Once the unidimensionality of constructs has been acceptably achieved, the validity and reliability of each construct are assessed.

2. Validity

Validity is the capability of an instrument to measure what is supposed to be measured for a latent construct. There are three types of validity necessary for each measurement model. They are:

a) Convergent validity

This validity was reached when all items in the measurement model were statistically significant. The convergent validity is also validated by calculating the Average Variance Extracted (AVE) for every construct. The value of AVE should be 0.5 or higher for the validity to achieve.

b) Construct Validity

This validity was reached when the fitness indices for a construct reached the required level. The fitness indices indicate how fit are the items in measuring the respective latent construct. In SEM, several fitness indices reflect how fit the model is. Hair et al. (2010) recommends using at least one fitness index from each category of model fit.

In SEM, several indicators of goodness-of-fit indices can be used to determine how well the model fits the data. However, Hair et al. (2010) recommends using at least three

fit indices from each category of model fit. Fit indices can be classified into three categories: absolutes fit, incremental fits and parsimonious fit indexes. Absolute fit indices include chi-square ($\chi 2$), GFI and RMSEA. The second category of incremental fit indices includes AGFI, TLI, NFI, and CFI. As parsimonious fit indices, it has Relative $\chi 2$ (CMIN/df).

The research model is said to fit (good) when the value from any category of incremental fit indices is greater than the cut value of 0.9 (Hair et al., 2010). As for the RMSEA criteria, the model is considered a good fit when RMSEA shows a value less than 0.08 (Hair et al. 2010). Next, if the CMIN/df ratios are less, then the model fits the data well. The information concerning the model fit category and its recommended value is described in more detail in Table 3.11 below:

Table 3.11: The Three Categories of Model Fit and the Level of Acceptance

Fit Indices	**Level of Acceptance**	**Comments**
Absolute fit indices		
CMIN ($\chi 2$)	P >.05	This measure is sensitive to a large sample size.
Goodness-of-Fit (GFI)	0.90 greater	A value close to 0 indicates a poor fit, while a value close to 1 is a good fit.
Root Mean Square Error of Approximation (RMSEA)	Between .05 and .98	Value up to 1.0 and less than .05 is still acceptable.
Incremental Fit Indices		
Adjusted Goodness-of-Fit (AGFI)	.90 or greater	
Tucker-Lewis Index (TLI)		

Normed Fit Index (NFI) Comparative Fit Index (CFI)		A value close to 0 indicates a poor fit, while a value close to 1 is a good fit.
Parsimonious Fit Indices		
Relative $\chi 2$ (CMIN/df)	Less than 5.0	The value should be less than 5.0

c) Discriminant Validity.

This validity specifies the measurement model of a construct and is free from redundant items. Discriminant validity is the correlation between exogenous constructs which should not exceed 0.85. A correlation value exceeding 0.85 indicates the two exogenous constructs are redundant or have serious multicollinearity problems (Awang, 2015).

3. Reliability

Reliability is how reliable the said measurement model is in measuring the proposed latent construct. The valuation of the reliability of a measurement model could be made using the following conditions.

a) Composite Reliability (CR) indicates the reliability and internal consistency of latent constructs. A value of CR > 0.6 is required to meet composite reliability for a construct. (CR is calculated using the given formula).

b) Average Variance Extracted (AVE) – the AVE shows the average percentage of variance explained by the measuring items for a latent construct. An AVE > 0.5 is required for every construct (AVE is calculated using the given formula).

AVE = $\frac{\sum\lambda^2}{n}$	λ^2= factor loading of every indicator n= number of items in a model δ= measurement error associated with each indicator
CR = $\frac{(\sum\lambda)^2}{(\sum\lambda)^2 + (\sum\delta)}$	

Stage 5: Specifying the structural model

Following confirmation of the measurement model, the structural model is specified by assigning relationships from one construct to another based on the conceptual framework developed previously in Chapter Two. Based on the hypothesis, there are two equations. In the first equation, while the independent variables are HRM practices, LMX, personality and work engagement. Meanwhile dependent variable is job performance. In the second equation, the independent variables are HRM practices and LMX, and the dependent variable is work engagement. In the third equation, the independent variables are HRM practices and LMX, and the dependent variable is personality.

Stage 6: Assessing the structural model validity

In this stage, the structural model's validity is studied using the same criteria as the measurement model described above. The individual parameter estimates representing each particular hypothesis are then considered. According to Hair et al. (2010), the proposed framework is considered valid to the extent that the parameter estimates are statistically significant and in the predicted direction. If the model fits, the data and the parameter estimates are significant and in the predicted direction, assessing the structural model.

3.7.4 Analysing the Mediating Variable in a Model

The research questions in this study address the influence of a mediating variable (work engagement and personality) in the relationship between an independent variable (HRM practices, LMX) and a dependent variable (job performance) in a model. According to Awang (2015), there are steps to identify whether the mediate variable is a mediator or not.

1. The direct effect of the dependent variable on the dependent variable is significant.
2. When Mev (mediator variable) enters the model, the direct effect would be reduced. It is because the effect has moved through the mediator.
3. Partial mediation occurs when the direct effect is significant, and Mev (mediator variable) reduces the mediation effect.
4. Meanwhile, full mediation occurs when the direct effect is not significant, and Mev (mediator variable) reduces the mediation effect.

This study also uses the steps outlined by Baron & Kenny (1986), SPSS is used to confirm the test for mediation. The steps are:

1. The predictor is related to the dependent variable.
2. The predictor is related to the mediator.
3. The mediator affects the dependent variable when the predictor is controlled for and reduces the relationship between the predictor and the dependent variable.

3.8 Chapter Summary

This chapter has outlined the research design, population and sample, data collection method and procedures, research measurement, and data analysis procedure. A detailed discussion to justify the need for a quantitative approach by using survey methods to answer the research questions has been presented in this chapter. This chapter also highlights sample selection, the sample size for the survey, pilot testing, the procedure to collect data, and the questionnaire design. The researcher also explained the procedures for data preparation and the statistical techniques used to test the proposed model's research hypotheses empirically. In the final section, the discussion was then concentrated on structural equation modelling (SEM), used in the study, explaining the model evaluation for measurement and structural model, as well as issues related to the reliability and validity of SEM analysis. Following this, chapter 4 will discuss the results of data analysis.