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Pedagogical Strategies in Developing Competency Profile for Enhancing Performance Level among Malaysian Building Surveying Graduates: Developing a Research Methodology

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Abstract: The performance of building surveying graduates should be defined and tailored to address the unique industry's requirements. This research aimed to propose a comprehensive research methodology, techniques and processes to develop a well-defined set of competencies that may effectively improve the performance of building surveying graduates in a specific Malaysian context. The suggested procedures for conducting future competency studies involve inquiry within a mixed-method design that combines both quantitative and qualitative methods. This blended methodology enables a comprehensive examination of competencies, supported by a strong epistemological foundation and a selection of appropriate research designs. The findings of this study could develop a robust and valid competency profile that is specifically tailored to Malaysian building surveying graduates by enriching the existing research methodology knowledge concerning the surrounding competence studies, thus, potentially enhancing the overall quality of the industry's workforce. This study will pave the way for further research that is aimed at establishing a competency profile that deals with both non-technical and technical skills for Malaysian building surveying graduates. Engaging in such an endeavour has the potential to enhance a holistic approach towards fostering competency in the subject, therefore, equipping graduates with the necessary skills to thrive in their future professional responsibilities.

Keywords: Building surveyor, Building surveying, Competency profile, Research methodology, Graduate employability

INTRODUCTION

Recent developments in Malaysia's higher education system have heightened the necessity for graduates of higher learning institutions (HLIs) to increase their competence level. Studies have reported that nowadays, employers are looking for fresh graduates with holistic competencies, such as soft skills, technical skills, digitalisation and technology skills, as well as possessing high moral standards, to

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ensure that undergraduates stay relevant with the latest industry trends (Khoo, Zegwaard and Adam, 2020; Bashir et al., 2021; Sarpin et al., 2021; Arowoiya and Akinradewo, 2022; Chan and Luk, 2022; Aliu and Aigbavboa, 2023). Accordingly, it is highlighted that there has been an increase in interest among researchers in various fields in competence studies that attempt to improve graduates' competence performance and employability skills.

The Malaysian government has recently proposed a number of strategies to work in tandem with industry and educational institutions to produce competent and skilled workers. The government, in collaboration with the Department of Skills Development and the Ministry of Human Resources, launched the Skills Malaysia Programme and Malaysian Skills Certification to develop competent, productive, responsive and resilient human capital in order to boost national productivity. The Ministry of Human Resource Malaysia and the Department of Skills Development have also established the National Occupational Skills Standard (NOSS) (2019), which describes the competencies expected of an employee at a certain level of employment (Department Skills Development, 2018).

Another endeavour is the establishment of the Malaysia Education Blueprint 2015–2025 for higher education by the Ministry of Higher Education, which aims to prepare Malaysian youth with the necessary skills and knowledge to thrive in a dynamic and evolving future. Together, the National Graduate Employability document (2012), the Malaysian Qualifications Framework's (MQF) first edition (MQA [Malaysian Qualifications Agency], 2007) and MQF's second edition (MQA, 2017) are the initiatives by the Malaysian government to improve graduates' competence and potential. In designing a training programme and instructional material for the construction industry, the Construction Industry Development Board, together with Majlis Latihan Vokasional Kebangsaan Malaysia, previously developed the National Competency Standard to enhance the skills of construction project managers. Also, the Royal Institution of Chartered Surveyors (RICS) (2018) proposed an Assessment of Professional Competence (APC) document for chartered building surveyor practitioners.

Meanwhile, the building surveying industry and the MQA have also established a programme standards document to serve as a guideline for HLIs to follow while designing a curriculum, student admission, academic staff recruitment and appropriate learning resources for a building surveying programme (MQA, 2013). All of these efforts imply the significance of a competency framework, model, or profile as an important assessment instrument in human capital management. Despite efforts from the government and professional bodies, the researchers are inclined to outline a competency profile for newly appointed building surveyors, who are often appointed as junior or assistant building surveyors. Thus, as a start, researchers offer a methodological approach for developing a competence profile for Malaysian building surveying graduates. It will provide the methodological approach, procedure and technique for generating such a competency profile in particular.

LITERATURE REVIEW

Competencies for Building Surveying Professions

The surveying profession, including the building surveyor, is subject to numerous changes, such as new roles in the public and private sectors, technological improvement, new market opportunities and revision of the education system. Hence, a competency profiling for building surveying graduates must be constructed to refine their skills' performance in the industry. Such a profile can also serve as the basis for the development or improvement of a building surveying programme.

Theoretically, competency is a fundamental trait of an individual that allows them to perform well in a certain profession, role, task, or situation. The trait is made up of groups of personal qualities, knowledge and skills that impact a person's ability to execute tasks (Spencer and Spencer, 1993). It is also related to individual behaviours and job performances, as well as capabilities or abilities based on a set of behaviours centred on an underlying construct (Boyatzis, 1982; Shermon, 2004). The role in the competency concept allows the role holder to perform competently, productively, creatively and innovatively to deliver high-quality service without waste, at the right time, with minimum effort and without stress (Gupta, 2012). According to Kruger and Dunning's (1999) competency concept, persons lacking competence may have difficulties accurately perceiving and demonstrating their level of skills when compared to those who are competent.

Spencer and Spencer (1993) emphasise the Iceberg Competency Theory. The theory provides five distinct categories of competency characteristics, including knowledge, skills, motives, traits and self-concept. This theory classifies competency into two levels, visible and hidden. Visible competency (knowledge and skills) refers to an individual's technical competencies that are necessary to execute well on a given task. The personal attributes placed on a hidden layer consist of motives, traits and self-concept, where these characteristics indicate an individual's behaviour, which is known to be challenging to cultivate.

Correspondingly, Shermon (2004) distinguished two types of competencies: technical competency and nontechnical competency (or soft skills). Technical competency in the building surveying industry refers to a specific area of expertise or a functional area such as knowledge or skill that is often obtained through structured training, such as formal education or coursework assessment. Nontechnical competency, or soft skill, is often considered a personal attribute or ability that is not exclusive to a particular sector or functional area (Shermon, 2004). To perform well in a professional setting, it is necessary for a building surveyor to possess a comprehensive range of visible and hidden competencies that include the essential behaviours, knowledge and skills that are required for achieving success in a particular role.

Previously, regulatory agencies at both national and international levels have produced a comprehensive competence document and set of standards for the building surveyor profession. For instance, internationally, the RICS (2018) proposed the APC document, which contains three levels of attainment: knowledge and understanding (Level 1), an individual's application of knowledge and understanding (Level 2) and the reasoned advice and depth of individual technical knowledge (Level 3). In Malaysia, the PWD (Public Works Department) (2017) created the Competency Model and Dictionary in order to effectively

monitor and guide the performance levels and career advancement of its staff members. In addition, the Royal Institution of Surveyor Malaysia (RISM) (2021) has established competency standards for all divisions under the RISM, which are classified into two categories, namely, core and optional competence. The Building Surveying Division (BSDiv) has identified seven core competencies and ten optional competencies that relate to the scope of building surveying work. For core competencies, building inspection, building control and compliance and space planning and measurement are the top competencies for building surveying practitioners. Building remeasurement, handling over management, technical due diligence, dispute resolution and conflict avoidance are examples of important competencies listed under the optional category.

However, in local and international documents and publications, the specified competencies were outlined as general for all building surveyor levels within the BSDiv rather than focused on entry-level graduates. There was no clear profile that provided the visible competencies needed by entry-level candidates applying for assistant building surveyor or junior building surveyor positions. Therefore, by proposing this study, beginning with the formulation of research methodology, the researchers were able to unveil the current and future competencies that are necessary for graduates who are doing entry-level work activities (e.g., junior building surveyor or assistant building surveyor).

Competency Performance of Graduate Building Surveyors

The issue pertaining to the performance of entry-level graduates is not just a matter of concern within the building surveying field but also includes quantity surveying, engineering, manufacturing and other technical graduates, as recently highlighted by Husain et al. (2020), Arowoiya and Akinradewo (2022), Ebekozien, Aigbavboa and Aliu (2022), Gilbert, Turner and Haass (2022), Newell and Ulrich (2022) and Venatius, Hatib and Boniface (2023) studies. In reflecting on the acceptability of the building surveyor profession among other professionals, Husain et al. (2017) have found that entry-level building surveying graduates lack sufficient soft skills and technical skills that are essential for meeting the current demands, rendering them ill-prepared to enter the real working field.

Zaheer et al. (2021) also agree that it is not necessary for graduate building surveyors to prioritise the development of one set of competencies over another since all important competencies synergistically contribute to the attainment of professional success. As most companies anticipate, international graduate building surveyors must improve their technical expertise and knowledge in building surveying, personal management abilities and awareness of RICS regulation and building law (Zaheer et al., 2021). According to Husain et al. (2020) and Zaheer et al. (2021), it is recommended that graduates who have deficiencies in technical competencies focus on effectively showcasing their personality and behaviour-based competencies throughout the various stages of the recruitment phases.

In the same vein, the RICS (2018) highlights that a building surveyor must possess the requisite expertise and proficiency to undertake a diverse range of responsibilities. These responsibilities span from overseeing substantial development projects to strategising residential expansion in the property and construction industries. A building surveyor in Malaysia is in charge of building control administration, building pathology, building audit, conservation, extensions and refurbishment work, condition survey and dilapidation report preparation (Ali and

Woon, 2013; RISM, 2022). Therefore, it is crucial for graduates to possess a clear understanding of the competencies that are necessary for them to acquire before joining the professional workforce. However, in the absence of a well-defined set of attribute requirements, the industry's demand would remain unfulfilled since institutions would lack clear directions for formulating a curriculum that effectively catered to the essential skills required by graduates (Ministry of Higher Education, 2012).

The literature findings suggest that while the present competency framework shares interrelationships with international standards, there are notable variations in roles and services that are tailored to the specific demands of the local industry. For instance, according to the RICS (2018) the competency path, contract administration is a core competency of a chartered building surveyor. However, it is noteworthy to mention that within the Malaysian context, the responsibilities of cost and contract administration roles have traditionally been encompassed within the professional domain of a quantity surveyor. The present competency framework also has several limitations in its ability to address expanding industry trends and adapt to technological advances and developments necessitated by the Fourth Industrial Revolution and Fifth Industrial Revolution within the construction sector. Therefore, it is essential to establish a standardised competency profile for graduates in the field of building surveying that is in accordance with industry practices and construction trends that are prevalent in Malaysia.

RESEARCH METHODOLOGICAL CONSIDERATIONS

The present study intended to propose a comprehensive research methodology, techniques and procedures to develop well-defined sets of competencies that may effectively enhance the performance of graduates in the Malaysian setting. A structured methodological approach could result in an organised and systematic approach to achieving the research aim. Thus, a clear research methodology model or framework will assist a researcher in describing a research process, identifying the research design and coordinating the research flow (Tobi, 2016).

The nested model by Kagioglou et al. (1998) was employed in formulating the research methodology framework. It stands out for having a pragmatic approach that combines a mixed-methods approach with an exploratory sequential strategy. The model employs three stages, namely research philosophy, research approach and research techniques and procedures (as shown in Figure 1). Figure 1 illustrates the research philosophy that was adopted for this proposed methodology framework that was consistent with the nested model. This decision was motivated by the researchers' desire to address research questions from multiple perspectives.

Figure 1. The research model designed is based on Kagioglou et al.'s (1998) nested model approach

RESEARCH PHILOSOPHY/PARADIGM

A research philosophy is a collection of ideas and beliefs that guide individual actions, including key assumptions pertaining to the way scholars view the world (Saunders, Lewis and Thornhill, 2007; Bajpai, 2011). The concept of philosophical assumptions pertains to three underlying assumptions, namely, epistemological, ontological and axiological assumptions (Creswell, 2014; Tashakkori, Johnson and Teddlie, 2020). According to Saunders, Lewis and Thornhill (2007), pragmatism researchers believe that the research questions play a crucial role in shaping their choices on epistemology, ontology and axiology. Therefore, a comprehensive discussion of the research questions that form the foundation of these three assumptions based on the pragmatic approach should be conducted through a competency study.

Researchers view the pragmatic approach, with the nested model and mixed-method approach, as the best method for investigating a competency study. The approach emphasises the implications of exploring the subjective experiences and perspectives of targeted participants. This sequential strategy is adopted because it is convenient and produces data that is straightforward to describe and report (Creswell, 2014). This method also helps the researchers to select the most suitable methods, techniques and procedures to fulfil this research requirement. It is the most appropriate procedure to be used in developing an instrument, especially when the preceding instrument is inadequate or unavailable (Creswell, 2014).

Epistemology

Epistemology concerns how the world is viewed in reality and how knowledge should be acquired and accepted. It is trying to answer the question: how may knowledge of that reality be established? (Tobi, 2016). Depending on the stage of the research, it could be from both objective and subjective points of view

(Tashakkori, Johnson and Teddlie, 2020). By referring to pragmatism as focusing on both points of view, the research question outlined for this study answered the question: "What are the competencies required for Malaysian building surveying graduates in performing professional functions and roles?" This question was highly pertinent to the research's focus, which was to understand the complex interaction between the current competencies needed to produce building surveying graduates in Malaysia as perceived by industry professionals. Instead of focusing only on methods, the nested model, with its blend of constructivism and pragmatism, offers a broader range of data sources and perspectives. This approach has the potential to provide a comprehensive and contextually nuanced analysis of the competency research, thereby increasing the overall validity and reliability of the findings.

Ontology

Ontology is described as an assumption that a researcher makes about the nature of reality of the research, which refers to "what and how" (Lu and Sexton, 2004). Ontology is linked to the question of what is the fundamental nature of the reality that is to be investigated (Guba, 1990), how things really are and how things really work (Denzin and Lincoln, 2008). Ontology suggests realism and idealism as the two ontological assumptions (Bilau, Witt and Lill, 2018). In the conception of reality, the competency standard or attribute document, model, framework, or profile for Malaysian building surveyor graduates remains unclear. In terms of the conception of how things really work and the nature of being the RISM (2021) competency document is overly general and does not focus on graduates (entry-level building surveyors).

Additionally, the Jabatan Kerja Raya (JKR) Competency Model and Dictionary focuses on the work of professional building surveyors who serve as government employees in the public sector and excludes private industrial professionals. By adopting this specific research philosophy and paradigm, researchers aim to address the basic principles that revolve around the nature of reality: "What should be the competency profile that works and is valid for building surveying graduates to perform the given tasks?"

Axiology

Axiology concerns the nature of value and the researchers' foundation of the value judgement (Lu and Sexton, 2004). It attempts to answer the question, "What values go into that knowledge?" (Tobi, 2016). The nature of the value of this research is based on the values that are important in interpreting the results and the researcher's choice of what to do (competency research) and the way to do it (applied mixed-method research). This research, which is based on pragmatism, applies both values (qualitative and quantitative) depending on the research questions and objectives.

For the axiological assumption, the "knowledge" of this proposed research is to develop a valid competency profile as a systematic guideline for Malaysian building surveying graduates and the "value" goes into developing and enhancing their competence and professionalism. To accomplish this aim, researchers contend that a nested model and mixed-method approach, which combine pragmatism

and constructivism, are highly suitable for the outlined research aim and objectives. This approach enables researchers to thoroughly explore the complexities of current competency performance among graduates and the essential skills needed to perform their professional services.

RESEARCH APPROACH

Research approaches include the strategic frameworks and systematic procedures that are used in the process of doing research, including the overarching assumptions guiding the study and the particular techniques that are employed for data collection and analysis (Creswell, 2014). This study used a research approach that emphasised the techniques and procedures that were involved in research design, population and sampling, as well as data collection and analysis. Accordingly, based on the pragmatism paradigm and with the help of the nested model approach, this study adopted the mixed-method approach (exploratory sequential design).

RESEARCH TECHNIQUES AND PROCEDURES

The proposed sequential mixed-method approach to be adopted in this research methodology framework is divided into three phases based on the research objectives. Table 1 provides a summary of the research techniques to be employed for this proposed competency study. Referring to Table 1, the specific research questions, as mentioned, are expanded to answer the main research question and objectives.

Table 1. Research matrix used in the conducted study

Research Objective	Research Question	Instrument	Sample	Sampling Method	Analysis
Phase I: Objective 1 To propose dimensions, constructs, and competencies elements required for the building surveying graduates	What are the lists of competencies required for Malaysian building surveying graduates to perform their professional functions and roles?	1. Document review and analysis 2. Systematic literature review (SLR)	1. Publication/ secondary data 2. Local and international competency documents	Snowball sampling	1. Meta-data analysis Content analysis: Cording analysis 2. Thematic analysis i. Expert validity: I-CVI index ii. Pilot test (Rasch analysis)

(*Continued on next page*)

Table 1. *Continued*

Research Objective	Research Question	Instrument	Sample	Sampling Method	Analysis
Phase II: Objective 2 To develop a competency profile for Malaysian building surveying graduates	What should be the competency profile that works and is valid for building surveying graduates?	Survey: Questionnaire form survey	Building surveyor registered with BSDiv and Royal Institution of Surveyors Malaysia	Cluster sampling	1. IBM SPSS statistics: Demographic result 2. Rasch analysis i. Reliability: a. Item and person b. Separation index ii. Item measure iii. Validity: a. Construct: Principal component analysis and item polarity b. Content: Item fit
Phase III: Objective 3 To validate the competency profile for Malaysian building surveying graduates as perceived by the experts in the building surveying industry	1. Are the constructs and items in the competency profile valid for building surveying graduates? 2. How useful and suitable is the competency profile for building surveying graduates, industry, and HLIs?	Competency profile validation questionnaire: Experts' validation	Representing building surveyors from JKR/ PWD, RISM, Malaysian Association of Registered Building Surveyors (MyRBS) and municipal council	Cluster sampling: Subject-matter experts	1. Content validity: Content analysis using I-CVI index 2. Content validity: Content analysis using the degree of agreement

Phase I: Qualitative – Construct and Item Development

Phase I began with the literature review, document review and SLR. They were the instruments to generate the competency elements (constructs and items) and to develop the research instrument (questionnaire) based on the findings. The secondary data encompassed various sources, such as journal articles, national blueprints and competency documents. As a result, a set of competency elements consisting of nontechnical and technical competency elements was generated, constructed and ascertained.

The process continued with the acquisition of an agreement from the panels in order to verify the results. The experts' responses were statistically assessed using the I-CVI. Specifically, the experts were requested to rate their level of agreement on a scale consisting of "Very Accepted", "Not Accepted" and "Accepted with Correction". In assessing the I-CVI, the theories adopted by Lynn (1986) and Hamzah et al. (2013) were considered.

The next stage was to determine the face validity of the developed questionnaire, including measurement validity and language validity. Face validity is concerned with determining whether a questionnaire is valid for the targeted subjects (Zamanzadeh et al., 2015). It involves evaluating whether the questions within the instrument are seen as relevant and free from unambiguous questions (Oluwatayo, 2012). Once the experts completed the validity protocol, a small sample of registered members of the BSDiv were approached to participate in a pilot study. The objectives were to identify the necessary competency components and identify any issues with the questions' wording or whether different participants interpreted the questions differently. The pilot study's data was analysed using the Rasch measurement model and then those results were used to develop a valid set of questionnaires for the actual data collection.

Phase II: Quantitative – Competency Profile Development

The main purpose of this second phase was to provide a systematic procedure for the second research question. The development of the question form was based on the set of competency elements that were obtained from Phase I. The questionnaire was then administered to a large sample of building surveyor practitioners who were registered with the RISM under BSDiv.

A random sampling employing cluster sampling was used to select the study participants. In 2023, BSDiv had a collective membership of 1,430 individuals, distributed across several categories, including fellow (22), member (332), graduate (298), probationer (72) and student (706) (RISM, 2023). Again, the data from the actual study was analysed using Rasch analysis to determine the items and participants' reliability, item measure, principal component analysis, polarity item and the item's fit. Next, the competency profile was developed and then presented to the selected expert panels in the building surveying field for validation in the subsequent Phase III.

Phase III: Quantitative – Competency Profile Validation

The final phase was to establish the validity of the developed competency profile. This stage focused on the output value of the profile towards answering the third research question. The competency profile was presented to the subject-matter experts in the building surveying field to gauge their comments and suggestions, thus demonstrating whether the competency profile is a reasonable representation of the required competencies for graduates.

The validation phase was classified into two phases: (1) expert validation for content validity and (2) expert validation for competency profile usability. The first phase, content validation, was limited to the accepted competency elements to be included in the profile and the deleted items (referred to as misfit items) based on the findings from the Rasch analysis. The close-ended content validation sheet in the questionnaire form was distributed to the experts. They were expected to state their response to whether an item was "Appropriate" or "Inappropriate" (the Guttman scale). The data obtained from this stage was analysed using I-CVI analysis.

Second, the expert validation for profile usability was limited to the appropriateness and usefulness of the competency profile, as well as the comments for future improvement. The closed-ended validation form was distributed and

analysed using content analysis (word-based analysis) to capture written comments, suggestions and recommendations from experts. Their degree of agreement was used to determine the validity of the profile. Their responses were indicated using the "Disagree" and "Agree" scales and were analysed using a percentage of the agreement. From this point, a valid building surveying graduate competency profile was developed.

Population and Sampling

This research used two types of sampling techniques: qualitative sampling and quantitative sampling. For qualitative sampling, a purposive method (nonprobability) of sampling design was applied based on expert sampling and snowball sampling techniques. The first step in this sampling procedure was to identify a group of experts and a few individuals. The participants were invited to indicate their willingness to participate in the study and whether they knew of any other person deemed suitable to answer the questionnaire. The recommended minimum sampling size for a qualitative study involving populations with the same demographic data is three to five participants (Lynn, 1986; Piaw, 2012) and a range of 20 to 30 subjects is acceptable for a grounded study (Creswell, 2014). However, according to most scholarly sources, it is generally advised that in qualitative research, the decision to continue collecting qualitative data is contingent upon reaching the threshold of data saturation, when the extra data gathered yields few new insights (Kumar, 2011; Creswell, 2014). Therefore, the documents (samples) are gathered based on the quality of the document rather than quantity (Bowen, 2009).

The sampling technique for document review began by scanning the database and the snowballing technique was used to search for publications that were not detected through reasonable combinations of key terms, followed by screening the relevant data. Meanwhile, the SLR approach was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Additionally, experts for content validity and face validity for the questionnaire development stage (Phase I) were selected, comprising experts in the building surveying field who were registered with BSDiv and RISM. They were experts representing the BSDiv (RISM), the PWD, the MyRBS and the municipal council was selected to participate in the profile validation (Phase III).

In the context of the quantitative investigation, a random or probability sampling design was applied to design the sample. The population was partitioned into distinct clusters, whereby the members within each cluster exhibited diverse features (Manoharan, 2009). The cluster sampling technique was chosen because it allowed a researcher to divide the sampling population into groups or different clusters without requiring a sampling frame (Kumar, 2011). The statistics of the building surveyor membership from the RISM (2023) indicated five classes of membership, namely, fellow (22) and member (332) (including MyRBS), graduate (298), probationer (72) and student (706) classes of membership. Due to the need to obtain experts' perceptions of the required competencies for the graduates, members of the student's class were excluded as the target participants.

DATA ANALYSIS

Data Analysis for a Qualitative Study

The qualitative approach began with reviewing information, reading and collecting quality data through a literature review, document review and SLR analysis. The purpose was to explore the actual situation and issues to obtain insight into the intention and underlying goals of this research.

A total of six steps for analysing and interpreting qualitative data, as suggested by Creswell (2012), was applied, namely: (1) the preparation and organisation of data, (2) the coding of the database, (3) the description of results and the formation of themes, (4) the reporting of findings, (5) the interpretation of findings and (6) the validation of the correctness of findings. The data that was obtained from the document review was analysed manually using meta-data analysis through content analysis with a code-based analysis that organises materials or data into distinct categories that were relevant to the primary research questions (Thomas, 2006; Bowen, 2009; Tobi, 2016). Meanwhile, thematic analysis was applied to the SLR approach, which focused on the search and generation of themes from selected databases.

Experts were then approached to statistically validate the obtained data from the document review and SLR. The I-CVI was used to assess expert agreement in testing the validity of the data. According to Oluwatayo (2012), the content validity of evidence was often determined by experts' judgement. The process of content validation generally sought to achieve convergence and corroboration by using several data sources and methods (Bowen, 2009). The triangulation of data could reduce the impact of potential biases that could be present in a single study by corroborating results across many data sets (Bowen, 2009).

Data Analysis for a Quantitative Study

Quantitative data analysis involves the use of statistical analysis techniques, including descriptive statistics and inferential statistics. The demographic data of the participants was subjected to descriptive analysis using IBM SPSS Statistics 24. The data was in the form of frequencies and percentages. Subsequently, inferential analysis was adopted to ascertain the correlation between the study variables through the use of Rasch analysis.

The use of Rasch analysis aims to enhance the precision of the constructed instruments, assess the quality and reliability of the instruments and calculate the performances of the participants (Boone, 2016). This Rasch measurement model analysis allows the analysis of the extent to which the collected data aligns with the measurement of the construct (Linacre, 2002) and presents valid data in more meaningful ways (Aziz, 2010). The Rasch analysis also seeks to address reliability (item reliability, person reliability, item separation index and person separation index), construct validity (polarity item and principal components analysis) and content validity (item fit). Additionally, an item measure table was used to ascertain the items that have garnered the highest level of consensus among the participants, which will then be included in the profile.

Data Analysis for Competency Profile Validation

The validation process consisted of two stages: (1) expert validation for content validity and (2) expert validation for competency profile usability. For the content validation approach, the average of I-CVI was used to analyse the data. The I-CVI quantifies the level of agreement about the relevance of each item, ranging from zero to one (Lynn, 1986). For the profile usability validation approach, a qualitative content analysis technique was chosen to interpret and code the textual material, assessing and capturing comments, suggestions and recommendations from experts. The degree of agreement, using the percentage of agreement, was used to determine the usability of the developed competency profile. According to Bowling (2009), a basic approach for assessing inter-rater agreement involves using a percentage calculation.

CONCLUSIONS

Considering the lack of consensus about the optimal methodology for conducting competency research, it is essential to develop a methodological framework and strategic plan for doing such a study. The current study provides an overview of the methodological framework, including the processes and procedures that are used in the formation of a competency profile. In terms of methodological contribution, a systematic research design provides direction for conducting a competency profile study, describing the research process and ascertaining the research techniques and strategies, particularly for data collection and analysis. In relation to the methodological contribution, the use of a systematic research design as constituted in the nested hierarchical model approach provides guidance for the execution of a competency profile for building surveying graduates, which includes the delineation of the research philosophy, research approach and techniques. The current study further presents the rationale for adopting a pragmatic philosophical position in addressing the research questions and attaining the research objectives, particularly by choosing a mixed-method approach with an exploratory sequential design and strategy.

The aim of this study was to propose and present a solid research methodology, techniques and procedures in order to establish and develop a well-defined set of competencies that may greatly improve the proficiency of graduates in the field of building surveying. Based on this implementation of organised methodological design and the establishment of partnerships between industry and university, it is suggested that novel research be conducted to develop a comprehensive competency profiling framework for Malaysian building surveying graduates that deals with both nontechnical skills and technical skills.

Moving forward, it is recommended that HLIs consistently provide help to students in acquiring the requisite talents, competencies and skills, beyond academic credentials and technical expertise, by assessing the current attitudes and expectations of employers about skills and graduates' performance. The formulation of a competency profile mainly for entry-level or fresh graduates helps in developing strategies and a blueprint to equip graduates with skills that are emphasised for career success. The necessity of collaboration between stakeholders, both academic and industry, lies in the refinement of the competence profiling framework, hence ensuring its relevance in improving graduates' performance. By

aligning competencies with industrial demands and educational goals, the future competence study may contribute to the expansion of a workforce that is highly skilled and adaptable in order to address the challenges that are posed by the dynamic built environment and construction sectors.

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