

A MULTIGROUP STRUCTURAL EQUATION MODEL FOR ASSESSING THE
COMPETENCY OF PROPERTY VALUATION GRADUATES

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DEDICATION

To my beloved daddy, mum, brothers, and sisters.

Praise ye the Lord

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ABSTRACT

The barriers for the development of the professions and career development of property valuation (PV) graduate is motivated and driven by the conflict and lack of alignment of industry, academic and professionals' perspectives on the skills and competencies required by PV graduates and professional. This study attempted to investigate PV graduate competency dimensions. This study aims to accrue major benefits to all parties; academia, industry and the professional bodies and valuation graduates by providing unified view towards PV professional development, greater satisfaction derived for all stakeholders, and producing balanced and employable PV graduates. The purpose of this two-phase, sequential exploratory mixed methods study was to explore participant's views with the intent of using this information to develop and test an instrument. This study was conducted based on the underlying pragmatic philosophical approach. The first phase was a qualitative exploration of a property valuation graduate competency by collecting interview data from a sample of 16 experts consisting of academic, industry and professional body representatives to determine the dimension of PV graduate competency and PV graduates' performance measures. Coding procedures of Hermeneutic Unit, and network analyses of ATLAS.ti were used to analyse the interview transcripts, and other primary documents to provide a full extent of competencies' coverage. The PV competency can be conceptualized as a composite of six dimensions such as valuation skills, property skills, property law skills, financial skills, strategic management skills, and transferable skills which are at the first-order level of abstraction. The second phase involved analysis of a survey of 54 academics of three Royal Institute of Chartered Surveyor accredited PV programmes, and 55 respondents of registered valuation firms. The PV competency at the second-order level of abstraction can be conceptualized as a composite of six dimensions such as valuation skills, property skills, property law skills, financial skills, strategic management skills, and transferable skills which are at the first-order level of abstraction. The quantitative findings have provided support for the research model through measurement of reliability and validity. Variance Accounted For index indicate transferable skills partially mediate the relationship between property skills and PV competency for Partial Least Squares (PLS) path model estimation. PLS–Multi-Group measurement indicates that there are significant differences between industry and academia assessment of the valuation graduate competency for law and transferable skills partial least squares path. Finding reveals that there is a variation of competencies achievement level across the stakeholders. The result from the study provides feedback for the competency which the valuation programme need to emphasis and thus acts as a mechanism for curriculum revision.

ABSTRAK

Halangan untuk pembangunan profesion dan pembangunan kerjaya graduan penilaian harta tanah (PV) adalah didorong dan dipacu oleh konflik dan kurangnya padanan perspektif industri, akademik dan profesional terhadap kemahiran dan kecekapan yang diperlukan oleh graduan dan profesional PV. Kajian ini dijalankan untuk menyelidiki dimensi kompetensi graduan PV. Kajian ini bertujuan memperoleh manfaat yang besar bagi semua pihak; ahli akademik, industri dan badan-badan profesional, serta graduan penilaian dengan menyediakan pandangan bersepadu terhadap pembangunan profesional penilaian, kepuasan yang lebih besar diperolehi semua pihak berkepentingan, dan menghasilkan graduan PV yang seimbang dan berkebolehan. Tujuan kajian kaedah campuran eksploratori berjujukan dua fasa ini adalah untuk mengeksplorasi pandangan peserta dengan maksud menggunakan maklumat ini untuk membangunkan dan menguji instrumen. Kajian ini dijalankan berdasarkan pendekatan asas falsafah pragmatik. Fasa pertama adalah eksplorasi kualitatif ke atas kompetensi graduan PV dengan mengumpulkan data temubual dari sampel 16 pakar terdiri daripada ahli akademik, industri dan perwakilan badan profesional untuk menentukan dimensi kompetensi graduan PV dan ukuran prestasi graduan PV. Prosedur pengkodan *Hermeneutic Unit*, dan analisis rangkaian ATLAS.ti telah digunakan untuk menganalisis transkrip temubual, dan dokumen-dokumen primari lain untuk menyediakan sepenuhnya cakupan kompetensi. Kompetensi PV dapat dikonsepsikan sebagai gabungan dari enam dimensi seperti kemahiran penilaian, kemahiran harta tanah, kemahiran perundangan harta tanah, kemahiran kewangan, kemahiran pengurusan strategik, dan kemahiran kebolehpindahan yang berada pada tahap abstraksi pertama. Fasa kedua melibatkan analisis kaji selidik terhadap 54 ahli akademik daripada tiga program Penilaian yang diiktiraf oleh *Royal Institute of Chartered Surveyor*, dan 55 responden mewakili firma penilaian berdaftar. Kompetensi pada tahap abstraksi kedua boleh dikonsepsikan sebagai komposit enam dimensi seperti kemahiran penilaian, kemahiran harta tanah, kemahiran perundangan harta tanah, kemahiran kewangan, kemahiran pengurusan strategik, dan kemahiran kebolehpindahan berada pada tahap abstraksi pertama. Dapatan kajian kuantitatif menyediakan sokongan model penyelidikan melalui pengukuran kebolehpercayaan dan kesahan. Indeks *Variance Accounted For* menunjukkan kemahiran kebolehpindahan merupakan pengantara separuh hubungan antara kemahiran harta tanah dan kompetensi PV bagi estimasi model laluan kuasa dua terkecil separa (PLS). Pengukuran PLS-*Multi-Group* menunjukkan terdapat perbezaan signifikan antara industri dan akademik penilaian untuk kompetensi graduan penilaian untuk laluan PLS kemahiran perundangan dan kemahiran kebolehpindahan. Penemuan kajian mendedahkan terdapat variasi tahap pencapaian kompetensi bagi semua pihak berkepentingan. Dapatan kajian menyediakan maklum balas kecekapan dalam program penilaian yang memerlukan penekanan dan bertindak sebagai mekanisme untuk penyemakan kurikulum.

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LIST OF ABBREVIATIONS

APC	-	Assessment of Professional Competence
BOVAEA	-	Board of Valuers, Appraiser, and Estate Agents Malaysia
CAQDAS	-	Computer-Assisted Qualitative Data Analysis System
CPD	-	Codes-Primary-documents
HU	-	Hermeneutic Unit
INSPEN	-	National Institute of Valuation
ISM	-	Institute of Surveyors Malaysia
IVSC	-	International Valuation Standards Council
PLS	-	Partial Least Square
PLS-MGA	-	Partial Least Square – Multi Group Analysis
PV	-	Property Valuation
RICS	-	Royal Institution of Chartered Surveyor
SEM	-	Structural Equation Model
UiTM	-	Universiti Teknologi MARA
UM	-	Universiti Malaya
UTM	-	Universiti Teknologi Malaysia
VAF	-	Variance Accounted For
VPSD	-	Valuation and Property Services Department

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This thesis is comprised of six chapters. Chapter one elaborates an overview of the research study. This chapter outlines the research problem and provides the deficiencies of past research within the research context. The next section presents the research purposes, research questions, and research objectives. Next, the research methodology is illustrated to achieve a research puposes. Finally, the last section of this chapter includes an outline of the remaining chapters of the thesis.

1.2 Research Problem

The property valuation industry in Malaysia has changed in dramatic recovery since the recession in 1987 and the real property market has reached its peak in 1996 before the economic crisis hit the region. Before the economic crisis hit, the most significant effect on the real property industry is the 1989-1996 property valuation boom, which triggers and attracted many investors involved in the property industry (Wilson *et al.*, 2011; Hishamuddin and Buang, 2006).

The uniqueness of the real estate industry compared to other industries, have affected the industry in its ability to predict the ability of new graduates in the region. Formal education or coursework alone is no longer a

prerequisite to becoming a real estate consultant. Wilson *et al.* (2016) stressed the importance given for the property valuation program and the need for periodic revision of curriculum content involving evaluation of all stakeholders.

There is a tridimensional pull from academia, industry and professional bodies on the property valuation's development needs. Professional bodies interested in graduates who are capable and enthusiastic appraisal to achieve full professional status through the attainment of the competencies expected. Property valuation¹ industry requires graduates who are able to contribute to the functionality and business activities and its business's growth. Meanwhile, academics keen to produce graduates who are well-rounded and have been infused with the knowledge of the principles of valuation and be able to cultivate and accomplish the required competencies (RICS, 2009a and 2009b; Perera and Pearson 2011, Wilson *et al.*, 2012). Thus, there is a three-dimensional pull of property valuation graduate development needs. Yet, the current education system does not recognize the need for a valuer with the multilateral requirements and often produce graduates who are seen and evaluated by the industry as did not congregate their requirements (Wong *et al.*, 2007; Lee, and Hogg, 2009; Perera, and Pearson, 2011; Wilson *et al.*, 2016). Therefore, this would lead this issue to a greater extent and causes the employer's dissatisfaction and thus, become an obstacle for early career development of property valuation graduates.

A debate on education versus training, and conflicts between educators and industry, has long been fuelled by the Royal Institution of Chartered Surveyors (RICS) that steer a more complicated route to reach agreement. From the other side, they advised Employers to accept graduates from the property valuation accredited programme whom eligible to hold a higher position than technician (which RICS itself has a special training route through the National Higher Diploma and Degree Foundation). While, on the one hand, they want the faculty to provide programs that

¹ Property valuation is defined as valuation assignment of any basis of valuation pertaining to real property in accordance with Malaysian Valuation Standards or generally accepted valuation principles and meets any other legal or regulatory requirement, which may be required by the client, advisors or any other relevant regulatory bodies (Malaysian Valuation Standards, 2015).

lean more towards academic rather than technical. The wrong notion made towards the property valuation industry creating confusion and conflicts with the competencies required by property valuation graduate. RICS has created a set of competencies requires the dynamic cooperation between the academic sector as a provider of knowledge and basic skills, and the industrial sector as a provider of practical training, through their business operations, and this competency has to be achieved by the candidates for membership (RICS, 2009a; RICS, 2009b).

1.2.1 Current Needs of Property Valuation Graduates

Industry needs are not much appreciated and often overlook by both academia, and professional bodies that may have newly graduated members. However, the industry also does not recognize and appreciate that the graduate is an individual who has a higher intellectual capacity and capability to develop and expanding their professional skills and technical knowledge (Perera, 2006; Lee and Hogg, 2009; Simpson, 2010). The barriers for the development of the professions and career development of property valuation graduate is motivated and driven by the conflict and lack of alignment of industry, academic and professionals' perspectives. In addition, failure to appreciate the dynamic of market sector itself is the most fundamental catastrophe made by all parties. The majority of the property valuation graduates are now choosing to follow the non-conventional property valuation path (Perera, 2006; Perera and Pearson, 2011).

1.2.2 RICS Assessment of Professional Competence

In the 1970s, nursing education has started and introduced competency-based education, and thereby achieving popularity in other fields. Formal and informal education and training throughout the world have also adopted this approach in the last forty years. Professional accreditation bodies in the built environment have as well been implementing a competency-based approach

(Trivett, 1975; Ewens, 1979; Cowan *et al.*, 2007; Mole *et al.*, 1993; Meyer and Semark, 1996; Newton, 2009).

The entry of graduates and others into any professional group as fully qualified Chartered surveyors comes only after they have successfully passed the Assessment of Professional Competence (APC). This is true of the Valuer, the specific subject of this study, as much as for any other. Key to this is the demonstration, by the candidate, of their having attained certain competencies determined by the Education and Membership Board of RICS. In the case of the graduate, these competencies will have been acquired both through their formal university education and the workplace training which they have received, whether as part time students in employment or during a work placement (Poon and Brownlow, 2014).

A balance to be struck between the level and type of competency that can be expected, and can be achieved, whether in universities and what arises from exposure to experiences that can only be found in the workplace, is very much appreciated. To some extent the two must be complimentary, as they should be, and it has emerged over the years that both Academia and Industry have certain expectations of one another, rightly or wrongly, as to what the other can and will achieve as a vehicle for graduate learning. These last are encapsulated, for some, in the arguments within the “education versus training” debate that has dogged the relationship for as many years as formal property valuation education has existed. From the above it will be seen that, at best, there is scope for misunderstandings between the stakeholders as to what is being required and what is being achieved. At worst there may be actual gaps in the education and, or training being offered and received or, at least, some discrepancies between the levels of attainment (Harris, Hobart, and Lundberg, 1995; Poon and Brownlow, 2014; Small and Karantonis, 2001; Newell, 2007).

1.2.3 Past Research on the Problem

Poon *et al.* (2010) conducted a wide-ranging literature review of research about the competency of property valuation graduates. They recognize that there is some research to see the required skill and knowledge of real estate and current course status, but concluded that the study is limited. Gibler *et al.* (2002) undertook an investigation into the property managers to identify the knowledge and skills required by the corporate property manager. Corporate real estate manager from Australia, Hong Kong, United Kingdom and the United States responded to the rating of the importance of knowledge and skills of 38 for corporate real estate management. The results show strategic skills and management are more important than technical and finance skills, whilst *strategic planning, real estate portfolio management, negotiations* and *deal making* was identified as "most important", while "foreign languages, finance / international economic and tax management" was rated as "least important" by the property valuation professionals.

Epley (2004) also attempted to identify the skills and knowledge needed by corporate real estate professionals. Corporate real estate executives are required to rank the areas of real estate decision making in relation to the importance of their areas of responsibility. Management, leasing, construction, real estate finance, acquisition and sales skills were identified as "most important". Corporate real estate executives have also identified a number of important concepts and skills required by the corporate real estate professionals, including interpretation of the market, general analysis, and people skills.

Callanan and McCarthy (2003) surveyed the employers in New Zealand to assess the skills acquired by property management graduates. They recognize that graduates have less knowledge of building construction and real estate development. The results of their study also revealed that graduates do not have the practical skills and knowledge and the ability to relate theory to practice, as well as a lack of knowledge of building construction and real estate development. Employers, however, they were positive about the analytical skills, computer and communication skills acquired by graduates. They have also made surveys on graduates and found

that graduates were lacking of economic expertise, planning studies, practical commercial content, and graduates felt that valuation or real estate management courses must infuse more of practical experience.

Galuppo and Worzala (2004) reviewed academic literature, held discussions with focus groups of company representatives and surveyed real estate professionals and alumni from the University of Wisconsin-Madison real estate programme. In their literature review, they reported that there was some agreement on what courses were offered in typical undergraduate real estate programmes – real estate principles, finance and appraisal or valuation – and found, in their review of university web sites, that not many of these subjects were covered in the existing graduate real estate programmes in the USA. They found that employers preferred new graduates to have experienced a project-based curriculum, while professionals and graduates wanted a diversified curriculum, though they both felt that existing core courses/modules were all important, and rated financial and communication skills as most important but that statistics and technology skills were least important. These findings were used to develop a graduate studies real estate programme at the University of San Diego.

Galuppo and Worzala (2004) recommended that programmes should encourage the development of all kinds of skills (technical, social and technological) and that they go beyond traditional business skills and incorporate a multidisciplinary approach. Weinstein and Worzala (2008) completed a similar study, building on Galuppo and Worzala's (2004) work, in which they interviewed educators, administrators and practitioners from 13 top real estate programmes in the USA about the elements needed to create successful graduates through these post-graduate programmes. They looked at newer post-graduate programmes and found that there were 11 themes that should be included in programmes to enhance real estate practice. The research identified that graduate programmes should be designed to produce graduates with the following key skills: decision-making, risk analysis, social and ethical responsibility, negotiation, critical thinking and problem solving, oral and written communication skills, leadership, use of technology and life-long learning.

Manning and Epley (2006) investigated whether the property has been teaching faculty and graduates to apply the skills and competencies required by the corporate real estate professionals. They have tested the variables that have been identified from previous studies by Manning and Epley (2006) and 2004 Gibler Epley *et al.* (2002). They found that some identified skills were taught in graduate and undergraduate programs of real estate, while there are skills that are lack of concentration, in particular, the general business skills.

In 2001, Institute of Surveyors Malaysia (ISM) has conducted a survey on graduates in real estate management and found that the performance of real estate graduates was contrary expectation of private organizations and public's perspective. In order to close the gap between the curriculum and the real estate industry, the expectations from the academics and practitioners should be adjusted. Real estate communities have to work collectively in developing the profession from the real estate graduates to the scope of the real estate profession (ISM, 2001; Wilson *et al.*, 2011).

In order to bridge the gap between the curriculum and the real estate industry, the expectation of academics and practitioners, the Institution of Surveyors Malaysia (ISM) in 2001, has taken the initiative to conduct a study on the real estate management graduates. The findings suggest that there are differences in the expected performance of the graduates of property, particularly between private organizations, and public perspective. Expectations of academics and practitioners need to be adjusted to close the gap between the curriculum and the real estate industry. In addition, this study also suggests that the real estate community must work collectively in developing the real estate profession (ISM, 2001; Wilson *et al.*, 2011).

Wilson *et al.* (2012) undertook research to assess the sufficiency of the soft skills embedded in real estate curriculum. The précis of the analyses signified that, soft skills infused in both coursework, and training has not met the needs of the graduates. The lack of integration of communication skills in English, leadership skills, and teamwork skills in the curriculum must be given due to attention as it is

also a skill that is perceived as a critical weakness of real estate graduates. This signifies that these skills are not adequately infused or acquired either by coursework or training.

1.2.4 Deficiencies in Past Research on Property Valuation Graduate Competency

The influence of industry on the development of this curriculum is becoming increasingly important in a world of rapid change. Design and delivery of programs by higher education providers need to understand and comply with industry expectations of the professional body for the program remains relevant. Higher education has an important role in professional development. There are a series of gaps between university education and industrial demand such as; over education and skills mismatches (Korka 2010; Wilson *et al.*, 2012). However, many past studies showed that the design and development of the current curriculum does not reflect and appreciate the needs of industry and industry practices (Perera and Pearson, 2011). Furthermore, Korka (2010) believes that the involvement of professional bodies and representatives of employers are still inadequate with higher education to provide learning content and learning outcomes of university programme.

The same scenario exists in a property valuation degree program accredited by the RICS. The report revealed that there is a considerable gap between the industry's expected competency of valuation graduate and what is actually attained. Therefore, RICS degree program often produces graduates who do not achieve the expected competencies because of dissatisfaction among the property valuation industry, and confusion among property valuation graduates. The situation is often disputed in academic circles who do not know what the industry really wants, misinterpretation and lack of proper attention, while the industrial sector has unrealistic expectations of property valuation graduates (RICS, 2009a; RICS, 2009b).

Further evidence from the literature reveals that there are stakeholders who are not satisfied with the preparation of property valuation graduates with specific property valuation competencies such as strategic planning, real estate portfolio management, lease, building, construction, real estate finance, negotiations, agreements, acquisitions and sales, practical skills and knowledge (relating theory to practice) needs attention and improvement (Callanan and McCarthy, 2003; Epley, 2004; Gibler *et al.*, 2002).

Many previous studies suggested that the program should become more aware of the concerns and needs of stakeholders by incorporating improvements to equip graduates for the industry. Many researchers have concluded that there should be a re-evaluation of course curricula, and suggested that programmes should become more aware of stakeholder concerns and needs by incorporating improvements to equip graduates for industry more effectively (Callanan and McCarthy, 2003; Massyn *et al.*, 2009). Many previous studies also suggest ways to improve education in the built environment and property, including improved practical skills training for students through work experience, case studies, training on the premises, and a site visit (Callanan and McCarthy, 2003; Wong *et al.*, 2007; Boyd, 2005).

Most of the studies discussed above using a single data collection strategy. Creswell and Plano Clark (2007) and Tashakkori and Teddlie (2003), states that mixed methods has its advantages. The use of both quantitative and qualitative research methods that involve different data collection strategies can improve the results of the study because they can complement each other. Mixed methods can achieve high validity and generalizability, and most importantly achieves research objectivity (Creswell and Plano Clark, 2007). Hence, mixed methods will be adopted for this study.

1.3 Purpose Statement

The purpose of this two-phase, sequential mixed methods study is to explore participant's views with the intent of using this information to develop and test an instrument with an academia of RICS accredited property valuation programme and Board of Valuers, Appraisers and Estate Agents (BOVAEA) registered valuation firm/industry. The first phase will be a qualitative exploration of a property valuation graduates' competency (*central phenomenon*) by collecting interview data (*type of data*) from a sample of 16 participants consisting of academics, industry and professional body representatives. The study also sought to review competencies of property valuation programmes of three RICS accredited property valuation Honours degree programmes in Malaysia and other primary documents to provide a full picture of the extent of coverage of competencies in the programmes accredited by the RICS. Finding from this qualitative phase will then used to test (*research questions*) the relationship of competency dimensions (*independent variable*) with performance measures (*dependent variable*), for graduate of property valuation RICS accredited program in Malaysia. The reason for collecting qualitative data initially is that there are inadequate instruments that need to be developed based on the qualitative views of participants.

1.4 Research Questions

This research attempts to answer the following questions;

- a. What are the property valuation graduates' competencies are expected from the curricula?
- b. What are the performance measures for assessing the competencies of property valuation graduate?
- c. What are the expected levels of property valuation graduates' competency after the completion of property valuation accredited programme?
- d. How does the property valuation graduates' competencies relate to the graduates' performance measures?

1.5 Research Objectives

The research objective comprises of three objectives;

- a. To determine the dimensions of property valuation graduate competencies and graduates' performance measures.
- b. To construct the property valuation graduate competencies and the performance's measures.
- c. To evaluate the relationship of property valuation graduates' competencies and performance's measures.

1.6 Significances of Study

The study contributes to the growing body of knowledge in property valuation competencies theories specifically on the graduates' performance measures. This study will fill the knowledge gap in the literature and in the same time also add knowledge to the property valuation competency. Inadequate evidence is available in the literature on property valuation competency that investigates the property valuation graduates competency namely, *valuation skills, property skills, property law skills, financial skills, strategic management skills, and transferable skills*. Thus, by investigation the property valuation competencies, this research expands knowledge on which of the property valuation competencies influenced the achievement of performance measures. This study has the potential to provide an understanding and explore new findings. In addition, this study will show the extent to which the proposed conceptual framework that can fill the gap. This research has identified the property valuation competencies need to be infused and embedded in the property valuation curriculum. There is no empirical evidence that indicates the importance of property valuation competency in the past research, but there are many studies involving competency in human resources management.

In terms of methodology, this study used sequential exploratory design consists of two distinct phases: qualitative followed by quantitative. The rationale for

this approach is that the qualitative data and their subsequential analysis provide a general understanding of the research problem. Text/Thematic analysis of Atlas.ti were used to get the dimensions of property valuation graduate competencies. To provide a full picture of the extent of coverage of competencies, the study sought to evaluate the Primary Documents. Furthermore, this study used Structural Equation Modelling (SEM) to examine all of the hypothesised relationships. The quantitative data and their analysis refine and explain those statistical result by exploring participants' views in more depth.

In addition, SEM takes into account the measurement error variances; thus, the relationships between the constructs in the hypothesised model were more accurate. This study overcame the limitations and provided a better insight into the relationship between property valuation graduates' competency and property valuation performance measures. This was accomplished through the selection of the appropriate philosophical foundations, research design, model, data collection methods and analysis techniques. The details of these are provided in Chapter 3.

This research has several managerial implications. By developing a structural relationship of property valuation graduate competency in the conceptual model, this study will assist the property valuation programme provider to identify property valuation competency dimension and measures, thus acts as a mechanism for curriculum design and revision. This should improve the better achievement and improvement of property valuation graduate's performance measures. In the educational aspect, this study has sought to obtain useful knowledge or information as well as obtain an in depth understanding on integration of property valuation competency in curriculum design. This study will also enhance the research potential of the investigators to explore all other issues related to the subject area in the future. The companies involved in this study at several stages, including the questionnaire survey and interviews will be disseminated with the findings. The educational aspect of the proposal has been designed to provide an excellent opportunity to both the graduate and undergraduate of property valuation to improve their understanding of property valuation competency and graduate performance measures. The findings have been disseminated through international journals, conferences and lectures.

1.7 Research Stance

This section outlines the research methodology of this study. The main challenge involved in this study was to develop and test a set of hypotheses concerning the competence criteria that will have an effect on the performances' measures of property valuation graduates based on the conceptual framework set out in Chapter 5. The overall research design was chosen for this study is based on a pragmatic paradigm, following the approach is relatively standard. Interview and survey method have been adopted to collect data and test the research model. The following paragraphs describe a brief overview of the methodological approach adopted in this thesis; whereas, a more detailed discussion of the methodology, research design, and issues related to the analysis of this data can be found in Chapter 3. There are two phases of the study: Phase One was to answer the research question concerning the dimension of valuation graduates competencies and performance measures by asking the expert to describe their views on the study, and Phase Two involved constructing and validating a questionnaire that could be used to construct the property valuation graduate competencies and performance measures. The research methodology is shown in the flow chart shown in Figure 1.1.

The interview were conducted to ensure the measure would be appropriate for assessing the property valuation graduate competencies. Sixteen property valuation education stakeholders consisting of academicians, professional body, and industry took part in the interview. The study sought to evaluate the interview transcripts, competencies of IVSC and RICS property valuation graduate route, competencies of three RICS accredited property valuation Honours degree programmes in Malaysia, and competencies' measured in previous study. The primary documents were analysed by the help of the Atlas.ti. The researcher used automatic coding features of Atlas.ti. The relationship between codes, quotes, and memos were expressed with the help of Network View. This enabled the researcher to draw relationships between property valuation competency and the performances' measures.

A questionnaire's details were developed based on the result obtained from the qualitative data analyses. The particular usefulness of the survey method was to measure the variables and to test the particular relationship between the variables (Coldwell and Herbst, 2004). The self-administered questionnaire was found to be the most appropriate data collection method for the purpose of analysis to test the hypotheses and answer the research questions (Bryman, 2008). The BOVAEA's registered property valuation firms, and property valuation academia of RICS accredited programme were chosen as the sample for this study.

Structural Equation Modelling was used to test the hypothesised model discussed in Chapter 5. The rationale for using this technique was followed as well. First, SEM allowed the simultaneous modelling of the relationship between the constructs (Hair *et al.*, 2010). Secondly, SEM was able to use the unobserved variables (i.e., latent constructs, such as accessibility and material) and their relationships through the use of multiple indicators. Finally, SEM allowed the presence of error components that causes the variables to not be perfectly measured (Goldberger, 1972). For this purpose, the Partial Least Square path modelling was found to be the most appropriate approach to test the hypothesis. This was due to fact that the proposed theoretical model in this study was considered complex since it incorporated 5 exogenous and 3 endogenous latent constructs (Figure 5.1). Furthermore, the PLS Multi-group Analysis was used to evaluate the significance differences amongst the property valuation academia and property valuation industry on the PLS model. The Multigroup analysis allows to test if pre-defined data groups have significant differences in their group-specific parameter estimates (Sarstedt *et al.*, 2011).

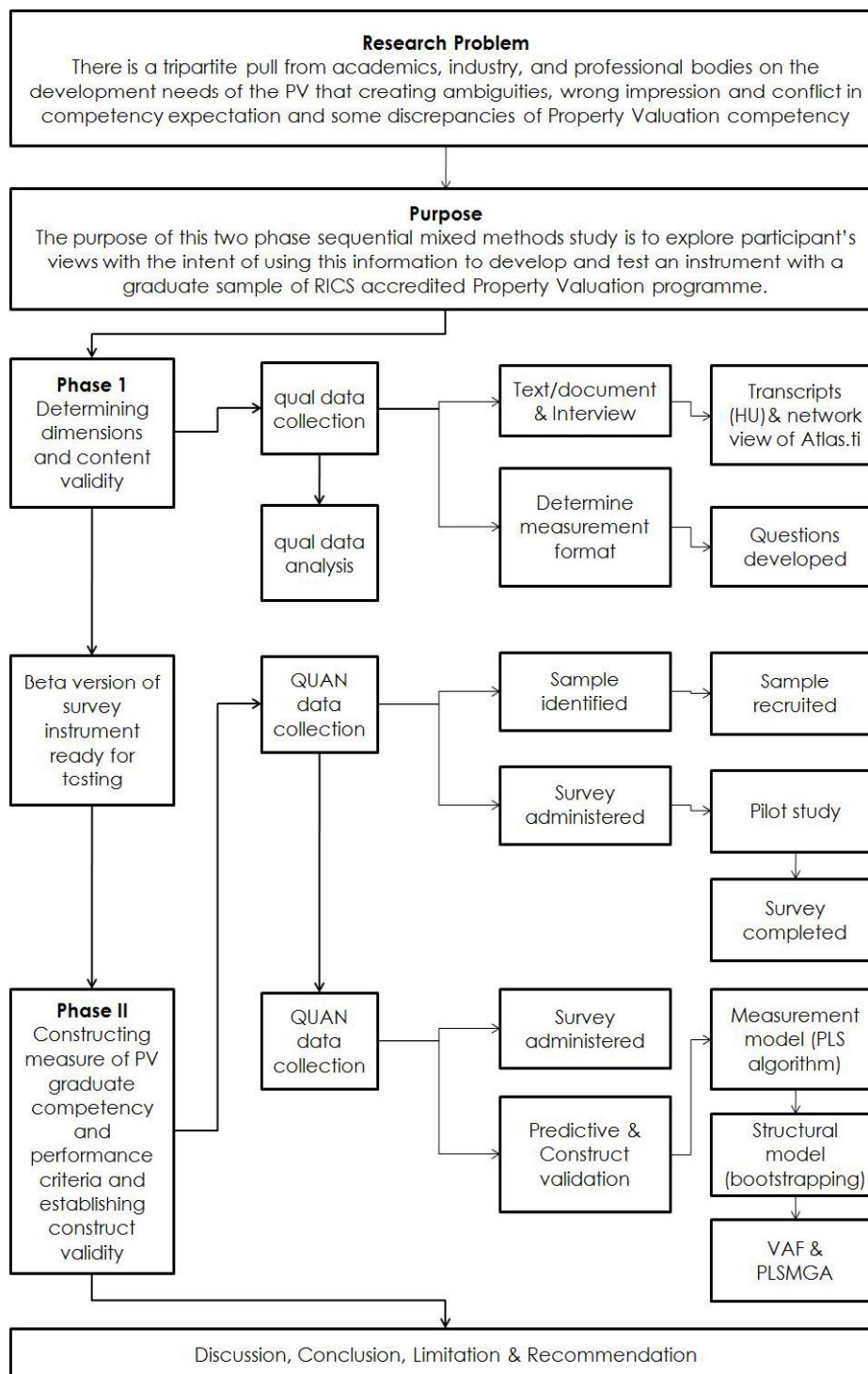


Figure 1.1 Flow chart of study

1.8 Organisation of the Thesis

This thesis has been laid out in 6 chapters. The chapters have been formulated on each other and are closely associated. The flow of the thesis is discussed as follows: Chapter 1 articulates an overview of the study. The chapter also includes a summary of the main research questions addressed in the study; as well as, a brief glimpse of the research design in which these questions were investigated. It further discusses the significance, scope and limitations of the research.

Chapter 2 provides a literature review related to the main theories and models of competencies, which formulate the conceptual framework of this research. First, it provides an overview of property valuation education's paradigm and its evolution. Next, the reviews of competency theoretical are described. This chapter also provides an overview of property valuation competencies. The chapter concludes with a discussion of the research gaps that have been identified from related literature.

Chapter 3 discusses the research methodology used in this study. This chapter starts with a brief discussion of the research paradigm and choice of paradigm that has been used. This chapter also provides an overview of the research design utilised in this study, including the preliminary consideration and research paradigm, mixed method typologies, data collection procedure, and sampling procedure. The next section justifies the data analysis techniques used to determine and identify the dimension/constructs and to test the hypotheses, thus answering the research questions.

Chapter 4 represents the result of the data analysis using Atlas.ti. This chapter discussed the finding and interpret the analyses of qualitative exploration of the study. The purpose of qualitative phase was to answer the research question concerning the dimension of property valuation graduates competencies and performance measures. Chapter 4 also presents the conceptual framework developed and explains the development of the hypotheses. The qualitative findings then were used to guide the development of the items and scales for a quantitative survey instrument.

Chapter 5 represents the result of the data analysis using a Partial Least Squares (PLS) technique. This is followed by a two-stage approach of the Structural Equation Modelling. The first stage examined the measurement model. This is followed up, with the assessment of the structural model. If the measurement model provides evidence of valid and reliable scale, it is appropriate to assess structural model estimates. Chapter 5 also explains the findings derived in details that include the achievement of the research hypotheses. Chapter 6 ends the thesis with a summary, contribution, and the recommendation for future work.

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