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Mismatch in Supply and Demand of Building Surveying Graduates' Skills: A Triangulation Perspective

Siti Hamidah Husain[1*], Adi Irfan Che-Ani[2], Haryanti Mohd Affandi[3], Nurfaradilla Mohamad Nasri[4], Nurhafizah Abdul Musid[5]

[1]School of Housing, Building and Planning,
Universiti Sains Malaysia, 11800 Penang, MALAYSIA

[2]Department of Architecture and Built Environment, Faculty of Engineering and Built Environment,
Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, MALAYSIA

[3]Centre of Engineering and Built Environment Education Research, Faculty of Engineering and Built Environment,
Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, MALAYSIA

[4]Department of Education Leadership and Policy, Faculty of Education,
Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, MALAYSIA

[5]Educational Planning and Research Division,
Ministry of Education, Putrajaya, 62604, MALAYSIA

*Corresponding Author

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Abstract: The mismatch in the supply and demand of graduates is fast becoming a central issue for employee performance nowadays. A primary concern of this issue is a result of a higher competence demanded by employers, the change in the industry, competition among graduates, and new global economic practices. Enabling industries to lead curriculum development is one of the initiatives in enhancing the quality of the programme to improve graduate employability and producing quality technical and vocational education and training (TVET) graduates. Despite the various models that have been employed towards individual career development, there are problems of job skills mismatch and the lack of qualified graduates with technical and non-technical skills. Thus, this study attempts to clarify a mismatch in the supply and demand of building surveying graduates' skills from the perspectives of employers, lecturers, and the students. This study investigates building surveying academicians and the industry's perspective regarding building surveying graduates' performance, as well as to identify students' awareness towards the current industry demand. Data for this study was collected using a qualitative method approach that involved a semi-structured interview with 10 building surveying students, 5 lecturers, and 5 building surveyor practitioners; the non-probability sampling design that was used in this study was based on the snowball sampling technique, and a content analysis approach had been employed in the analysis of the data using NVivo 11 software. The findings indicate that there is a mismatch in the supply and demand of building surveying graduates' skills. This study offers an important insight into the building surveying programme towards the improvement of the programme's syllabus and its learning outcomes. The study suggests that building surveying graduates should acquire and demonstrate both technical and non-technical skills that are demanded by the industry. Further research is suggested to identify the competency level among entry-level building surveyor graduates in real working practices.

Keywords: Building surveying graduates, building surveyors, mismatch in supply and demand, higher learning institution, Malaysian construction industry

**Corresponding author: sitihamidahhusain@usm.my*

1. Introduction

The Ministry of Education Malaysia (MOE) (the Ministry), together with the Ministry of Higher Education (MOHE), has developed several models to enhance the competitiveness of Malaysian graduates that are required by the new economy. The Employability Attributes Frameworks that were introduced in the National Graduates Employability Blueprint 2012-2017 aimed to produce an employable talent pool in Malaysia and were designed with the four generic student attributes: academic, personality management, exploration, and connectivity attributes (Ministry of Higher Education, 2012). Previously, the MOHE introduced the soft skills development module in 2007, consisting of seven skills and some of the strategies in order to address the graduates' unemployment problem (Ngang, 2011). Besides that, the Malaysian Qualifications Agency (MQA) had introduced eight domains of competencies in the Malaysian Qualifications Framework (MQF) 1st edition and five clusters of learning outcomes in MQF 2nd edition document as a guideline for Higher Learning Institutions (HLIs) in designing a comprehensive programme of study (Malaysian Qualifications Agency, 2007: 2017).

Subsequently, the Ministry had developed the Malaysia Education Blueprint (MEB) 2015-2025 (Higher Education), which highlighted the 10 Shifts initiatives that addressed the performance issues in the Malaysian higher education system. The first four initiatives consist of the holistic, entrepreneurial and balanced graduates, talent excellence, the nation of lifelong learners, quality technical and vocational education, and the training (TVET) of graduates (Ministry of Education Malaysia, 2015). Corresponding to the building surveying (BSr) programme as one of the technical graduates' provider (Higher Education), TVET aspiration plays a significant role in providing a highly skilled workforce with both soft skills and technical skills that are required by the industry (Ministry of Education Malaysia, 2015). Also, the engagement of industry in TVET institutions plays an enormous role in solving the skills mismatch problem, curriculum development, study visits, scholarships, and apprenticeship training and incubation center (Ashari and Rasul, 2014).

Surveying is a discipline that requires an integration of multidisciplinary knowledge, including construction and property matter, built environment as well as technology. The BSr practice involves a variety of services across the whole of the created environment field (RICS, 2018). The core competencies of Malaysian building surveyors include building maintenance and conservation, risk management and building audit, building insurance, building control administration, building inspection, building works, building quality, as well as development and construction management (Husain, Che-Ani, Affandi, & Nasri, 2018; Royal Institution of Surveyors Malaysia, 2015; Malaysian Qualifications Agency, 2013; Che-Ani, 2013; Ramly, 2003) . As a part of the technical construction practitioners, building surveyors are required to advise on every aspect of the built environment and land use (Dickinson, 1999) and are required to deal with many parties including clients, design teams, contractors, subcontractors, suppliers, and other construction professionals.

Given the diverse roles and tasks, there is a high requirement for building surveyors to be equipped with both sets of soft skills and technical skills. In the previous article, Dickinson (1999) has mentioned that building surveyors' skills are acquired through a combination of academic training and practical experience. This strong foundation of academic and practical knowledge equips graduates with the ability to provide a wide variety of core services throughout a property's total life cycle, either at the pre-occupation stage and during an occupation (Dickinson, 1999). However, the demand for Malaysian BSr graduates is not in elevation point compared to developed countries (e.g., the United Kingdom and Austria) due to a range of challenges. The challenges that are described here encompasses the lack of promotion, no specific regulated Act, slow acceptance of other professionals, lack of recognition by the public, and a lack of response for professional membership (Ali & Woon, 2013).

Besides, the high expectation of employers and the big challenges of the jobs' nature will pose to be challenges for the entry-level building surveyor (graduates) at securing employment. Despite rising demand for qualified graduates, other construction professionals still debate the capabilities and performance of BSr graduates (Ali & Woon, 2013). Similarly, in a recent article, Zaharim, Yusoff, Omar, Mohamed, and Muhamad (2010) have claimed that an excellent academic degree alone is inadequate because employers nowadays are looking for competent candidates. Rahman, Mokhtar, and Hamzah (2011) have found that employers nowadays are expecting fresh graduates with the desired skills without additional training. This view is supported by Mohamad et al., (2019) and Abu et al., (2008), who have written that most employers currently appraise the graduates' soft skills compared to their academic qualification.

Furthermore, most of the employers have claimed that the fresh graduates that are produced by HLIs are lacking in communication skills and have poor character, attitude and personality (Ministry of Higher Education, 2012). There is a mismatch in supply and demand of a graduate's skills, where employers are reporting that graduates still lack the requisite knowledge, skills, and attitude (Ministry of Education Malaysia, 2015). Evidently, BSr graduates are still equipped with inadequate skills in both soft skills and technical skills and are not competent enough to enter the working field (Husain, Che-Ani, Affandi, & Nasri, 2017). Subsequently, job mismatch, the lack of science and technical graduates, as well as the lack of qualified graduates with technical skills, are the problems that should be sustainably and responsively addressed (Ministry of Higher Education, 2012).

Recent developments in the Malaysian education system and TVET programmes have heightened the need for HLIs to prepare graduates with the knowledge and skills that are required in the industry to increase their employability. Therefore, the BSr graduates' performance issues, high market demands, and skills mismatches could be resolved through the active collaboration between the industry and the TVET provider that offered the BSr programme in the HLIs. Thus, this indicates a need to understand the current market of the supply-demand of skilled BSr graduates to ensure that supply matches the demands. In the context of the BSr field, many graduates are experiencing inadequate employment opportunities due to the current economic status (Isnin, Badrol Hisham, Ramele, & Ahmad Zawawi, 2016) and the high demands from the employers. Despite the mission of the National Graduate Employability Blueprint 2012-2017, to place graduates in their relevant fields within six months of their graduation, there is a trend where the BSr graduates are working in different areas after they have graduated (Ali & Woon, 2013). Although extensive research has been performed on this mismatch issue, however, previous studies in this field have not dealt with the mismatch of the supply and demand issue in the building surveying field. Thus, this study examines the mismatch in the supply and demand of graduates' skills from the perspectives of BSr students, lecturers, and building surveyor practitioners.

2. The Relevance of Individual Competence and Job Demands

High performing individuals are a critical variable in the success of any organisation. Organisations need highly performing employees to meet their business goals, while individuals need the skills to deliver company products and services (Sonnentag & Frese, 2002). A recent study by Gupta (2011) has reported that along with core competencies, the individual is required to develop a variety of professional competencies. However, Kruger and Dunning (1999) have mentioned that incompetent individuals are more challenged in recognising their own level of ability and performance compared to more competent individuals. A model of effective performance by Boyatzis (1982) has suggested that practical action and performance only occur when all three critical components including the individual's competencies, the job's demands, and the organisational environment are consistent.

Collectively, Boyatzis (1982) model highlights the need to identify an individual's competencies, industry's demands, and the organisational environment in producing effective individual behaviour. Similarly, Shermon (2004) highlighted the stages of the process of developing an organisation-wide competency model which involved the identification of jobs, major categories of skills as well as the probable competencies (Shermon, 2004). The evidence presented in this section highlighted the need to identify BSr graduates' skills as required by the industry. This view is supported by the Ministry of Higher Education (2012), which mentions that without a precise specification on the attributes requirement, the industry's demand will not be met due to the absence of a clear guideline for the universities in designing a curriculum that addresses the essential needs. Together, these findings have thus far provided evidence that in producing skilled graduates, it is necessary to establish a list of individual's competencies and job's demands so that the university can design a curriculum that addresses specific actions or behavioural needs. These literature findings further support the idea of this study to clarify a mismatch in the supply and demand of the BSr graduates' skills from the perspectives of employers, lecturers, and students.

3. Methodology

The research methodology design in this study followed the Nested Model approach in order to determine the appropriate methodology and to describe the research process as well as to coordinate the research flow (Kagioglou, Cooper, & Aouad, 1998). The Nested Model approach, as shown in Fig. 1, refers to the three stages that are constituted within the research philosophy, research approach, as well as techniques and procedures. The semi-structured interviews instrument is sufficiently structured to address specific dimensions of this research question and offers a space for the respondents to offer new meanings to the topic of study (Galletta & Cross, 2013).

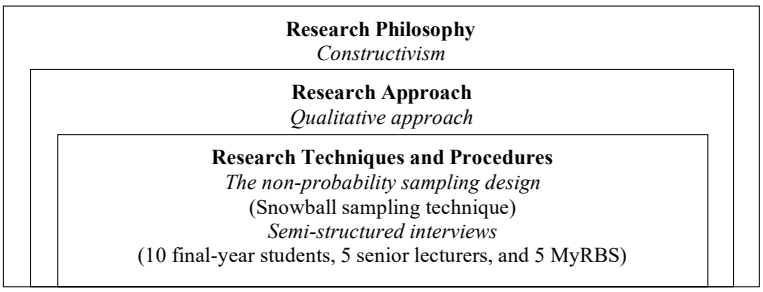

Fig. 1 - The Nested Model approach adapted from Kagioglou et al., (1998).

Therefore, three sets of the questions have been developed from the initial literature review process which is based on Malaysia's BSr industry, building surveyor, skills, competency and performance as keywords in searching for related sources for the current study. Based on the initial finding from the literature, a mismatch has been identified between

expectations and reality which is not only an issue for the employee (graduates), but also for the employer. Consequently, these three sets of questions have been developed to assess the respondents' views and perception as a construct for each respondent with specific themes of questions, respectively; as shown in Table 1.

Table 1 - Questions specification table.

Number of respondents	Constructs	Themes	Number of questions
10 Students	Mismatch in supply and demand of building surveying graduates' skills	Problems faced by students during the learning process	2
		Student awareness of industry's attributes requirement	3
5 Lecturers		Problems faced by students in performing their assignment and tasks	3
		The performance of building surveying graduates	2
		The necessity of industry's attributes	2
5 MyRBS		Problems faced by entry-level graduates in performing their assignment and tasks	3
		The performance of building surveying graduates	2
		The necessity of industry's attributes	2
20		5 themes of question	19

Furthermore, the non-probability sampling design is used in this study, based on the snowball sampling technique. A few individuals in a group are selected, and they are then asked to identify other people in the group to become a part of the sample for this study (Kumar, 2011). There is no reasonable amount of sample size for qualitative research. However, a sample size as small as five subjects with the same characteristics is acceptable (Piaw, 2012). Also, five or six one-hour interviews will provide sufficient data to lead to saturation (Corbin & Strauss, 2015). Therefore, a series of semi-structured interviews were conducted with ten final-year students who had completed the practical training programme, five lecturers, and five building surveyors from the Malaysian Association of Registered Building Surveyors (MyRBS), which involved multiple samples within one study.

Subsequently, the qualitative data from the interview have been analysed using a content analysis approach. According to Tobi (2016), this content analysis is useful for discovering patterns of ideas in the body of the text, and it helps to identify information throughout the transcript. The data analysis starts with a general review of all the information that has been obtained from the interview sessions. Secondly, the data is reduced and filtered by categorising the interview questions into five thematic distinctions as shown in Table 1, which aim to capture the critical point or opinions of the respondents. This study used the NVivo11 application software for content analysis, and the findings were transferred to the following tables as stated in the result and discussion subtopic.

4. Results and Discussion

The finding of the interviews shows that there is a mismatch in supply and demand of BSr graduates' skills. This study captured a triangulation perception of the respondents about BSr graduates' skills and performance. The findings are divided into three sub-topics which represent the triangulation perception for students, lecturers, and building surveyors. The arrangement of the list of problems is listed in an index from highest to lowest based on the priorities of the answers that are gained from each interview session.

4.1 Interview Session with Building Surveying Students

Several themes have surfaced regarding the problems that are faced by the BSr students during their learning process. Most of the students are aware that they still lack in communication skills, leadership skills, confidence level as well as language proficiency, especially in the English language. Somehow, these gaps have led to a mismatch between the industry demands and the graduate skills that is produced by HLIs. The list of prioritised problems will be explained as shown in Table 2. For the interview session, six participants were from quantity surveying, building, and construction management background. Most students have raised the concern that in the first semester, it is difficult for them to encounter the BSr subjects. As one participant explained, "I perform well in completing the assignment, but have a problem in approaching the client and lack communication skill" (R1); another said, "I am having a problem giving instruction to team members, cannot be a good team leader, but can work well with a team" (R2).

However, from the third semester onwards, they are showing remarkable progress and are able to follow the related subjects as outlined in their learning outcomes: "for the first semester, I have zero knowledge in building surveying because I am from a different programme (building), but I am able to survive until the final semester because I have basic knowledge of construction during the diploma programme" (R4). Another said, "I am from diploma quantity surveying, and need to learn new knowledge e.g. building pathology, design, building survey, thus I need time to learn…during diploma, focus on preparing a contract, but time degree needs to conduct a survey" (R5). Notably, it is different for

students who are initially from the Diploma of Building Surveying; they have no problem to understand, adapt and adopt their technical knowledge to the degree level of the syllabus.

The participants were very optimistic that they can work effectively as a team and are able to manage the given tasks without any arguments: "no problems to follow the study…just need early preparation, separate the tasks to facilitate the given assignment" (R2). Another has pointed out: "can follow the syllabus…need to alert with the submission date and build good teamwork and social skill" (R8). Accordingly, they were asked about technical knowledge as BSr students were trained with the appropriate technical skills and were given the initial exposure that was related to the implementation of technology in surveying work, for example, AutoCAD and Revit systems: "we are trained well and have basic knowledge in building construction, building inspection, and are well trained to communicate and approach other professionals" (R4). Another pointed out that a good exposure during practical training would create a prodigious platform for the students in practising their technical knowledge: "through practical training, could practices knowledge on building elements, AutoCAD software...learn to conduct building inspection, approach people during inspection work" (R9). However, construction players have suggested that graduates need to equip themselves with communication skills at all levels, practical training and knowledge in technology (e.g., Building Information Modelling, Facilities Management, and Safety and Health training) as one of the preparations for them to meet the growing or changing demands of industries (Isnin et al., 2016).

Table 2 - Interview summary with students.

Key Issues/Themes	Students' Interview Findings
Problems faced by students during the learning process	1. Lack of communication skills (e.g., to approach other professionals and building owners/clients) (R1, R2, R3, R4, R5, R6, R8, R9) 2. Lack of technical knowledge on a programme of study (especially students who are from different fields of study) (R3, R4, R5, R6, R8, R9, R10) 3. Lack of leadership skills (R1, R3, R5, R6, R10) 4. Lack of confidence level (R2, R4, R9, R10) 5. Language proficiency, especially in the English language (R1, R2, R3, R7)
Students' awareness of the industry's attributes requirement	1. "Aware and always be updated by my lecturer regarding the industry needs" (R1) 2. "Yes, I am aware of the current industry requirement" (R2) 3. "Not sure…did not perform practical training building surveying company…but realise that industry more focused on soft skills e.g., leadership" (R3) 4. "Not clear about what industry needs…current demand" (R4) 5. "Realise what industry needs after performing practical training…before this, only focus on building pathology and maintenance…after practical training, realised building surveying scope also covers on space and building audit" (R5) 6. "Aware because performing practical…need to learn working skills e.g. approach client and building owner for getting permission for conduction building inspection" (R6) 7. "Not exposed and unconscious" (R7) 8. "Yes, I know because already accomplished practical training program" (R8) 9. "Aware…know about building surveying scope of work, need to know about building element and current technology used in building surveying industry" (R9) 10. "Did not know" (R10)

When they are asked to reflect on their awareness towards the industry's attributes requirement or current skills demanded, most of the participants claimed that they are aware and are continuously updated by their lecturers on the current demands from the employers. This significant awareness is also gained through the practical training programme. However, there is a pattern where some of the students have not performed their practical training in a relevant company. This might lead to a restricted exposure and awareness of a real building surveyor's working practices in the construction industry. This situation is resulted from the limited number of BSr companies that may lead to the limitation of options for students to carry out their practical training at a relevant surveying company. In the same vein, the issue of inadequate employment opportunities has largely been confirmed in a study by Isnin et al., (2016), where the BSr industry seems unable to accommodate the percentage of graduates that are produced by the HLIs in Malaysia.

Due to insufficient employment opportunities in a challenging economy, the mismatch between industry demands and graduates' skills compounds the problem of high levels of unemployment. It is also a factor that has forced the graduates to explore the different employment fields after they have graduated. Bank Negara Malaysia in the Annual Report 2016 has released that young unemployment rate rose from 3.1% in 2015 to 3.5% in 2016, due to slower job creation and a moderate economic growth (Bank Negara Malaysia, 2017). The culmination of the issues, the collaboration between the education and training sectors or TVET provider with the BSr industry is one of the initiatives to shape the education curriculum in accordance with the market requirements. The continuing collaboration could also provide job placement for the graduates' career development and offer opportunities for the BSr students to perform their practical training programme in a relevant company.

4.2 Interview Sessions with Building Surveying Lecturers

The results of the interview with the lecturers can be summarised, as shown in Table 3. The participants had identified that most of the students encountered challenges during their first year: "first semester, zero technical skills…no basic knowledge in technical drawing, AutoCAD, especially students from the different study background…lack of communication and presentation skill, language problem (English), not confidence, and having problem in time management…not exposed to real practice on town planning, and pathology" (R1). One participant had responded, "technical knowledge and other attributes could be developed through learning and working experiences" (R5). It is confirmed that students who are developing competence in basic job demands have somehow increased the opportunities to get employed in the future. However, this strongly depends on how the students will transfer the knowledge and learning experiences to real working practices: "soft skills could be developed through long-life learning process…writing skills, no problem…lack of presentation skill (English language), communication skills, source management and problems solving" (R2).

Furthermore, the respondents had expressed that students from different fields of studies dealt with the same problems as BSr students, especially in soft skills attitudes: "others student from the different study also faced with same skills problems…soft skills problems, e.g., problem-solving, information and source management for assignment, time management and leadership skill" (R3). Due to this programme being a new course compared to other professional courses in Malaysia, the BSr Act's endorsement will create more jobs and opportunities for students to pursue their own enterprises. One participant explained, "only a few available companies are capable of offering practical training positions and employability opportunities due to a limited number of registered BSr companies in Malaysia" (R4).

Table 3 - Interview summary with building surveying lecturers.

Key Issues/Themes	Lecturers' Interview Findings
Problems faced by students in performing their assignment and tasks	**Non-technical competency** 1. Presentation skills (R1, R2, R3, R5) 2. Communication skills (R1, R2, R4, R5) 3. Information and source management skills (R2, R3, R5) 4. Language proficiency especial in the English language (R1, R2, R5) 5. Confidence level (R1, R3) 6. Problem-solving skills (R2, R4) 7. Time management skills (R1, R3) 8. Teamwork skills (R3, R5) 9. Leadership skills (R3, R4) 10. Student's attitudes (R3, R5) **Technical competency** 1. Lack of technical skills and knowledge in building surveying fields for first-semester students from different field of studies (R1, R3, R4, R5) 2. Lack of terminology of building elements, defects, and building material (R1, R2, R5) 3. Lack of knowledge, e.g. town planning and building pathology subjects (R1, R4) 4. Lack of awareness on building surveyor roles and tasks (R2, R4)
The performance of building surveying graduates	1. "Lack of communication and presentation skills…but there is a high demand from industry… graduates can consider interior design as a second career…they have a basic knowledge, AutoCAD software and design subjects" (R1) 2. "…graduates skills, BSr programme already fulfilled all requirement…it depends on how the students will bringing themselves and perform at the workplace" (R2) 3. "Not enough…what we deliver, yes have some input from industry…the fact that we start from zero, we interpreted knowledge with practical…but industry, expects for a knowledgeable student that ready for industrial" (R3) 4. "Syllabus, we followed all learning outcome…students, have a basic, but it depends on other factors e.g., initial exposure…numbers of BSr company that available for offering job opportunities or practical training to practising their skills" (R4) 5. "Performance, average level…example, conduction building inspection in the real practice, need to employed building control knowledge, building pathology" (R5)
The necessity of industry's attributes	1. "Indispensable…university and industry…collaborated to revised and reviewed the syllabus to ensure the programme offered is relevant to industry demand" (R1)

Table 3 - (Continue)

Key Issues/Themes	Lecturers' Interview Findings
	2. "Indispensable…university and industry…collaborated to revised and reviewed the syllabus to ensure the programme offered is relevant to industry demand" (R1) 3. "Excellent suggestion…can enhance graduates' competency from time to time to fulfil industry needs…we are developed country, need to follow the current change" (R2) 4. "Strongly agreed…always welcoming suggestions from industry, learning outcome, matched with MOHE attribute, too general…for now, no competency standard…industry, association, should come out with competency" (R3) 5. "Agreed…currently, university and industry collaborated…comment and revise the syllabus to ensure it compliment with industry needs…we have code of practice but no specific attributes for Bsr" (R4) 6. "Sure, agreed…collaborated with industry in designing our syllabus…documentation there, but the question is, are they (students) practices it or not in the real practice" (R5)

Evidently, there is a demand for building surveyors in the Malaysian construction industry, and graduates are able to get an attractive salary that is equivalent to other construction professionals (Ali and Woon, 2013). The participants identified who were BSr graduates received positive feedbacks from the industry regarding their multi-purpose knowledge in the construction industry. Several participants stressed that the BSr programme fulfilled all necessary non-technical skill requirements as outlined by the MOE and MQA for the development of the curriculum: "the revisions of the BSr programme directly received an input from industry practitioners" (R4); "the collaboration with the industry is to upgrade and review the syllabus…this is to ensure the programme outcomes are still relevant with industry demand" (R3). However, despite accomplishing all industry requirements, the BSr students are still burdened with the same performance issue.

The participants have mentioned that the universities are aware that the industry expects a skilled and knowledgeable student who is ready to perform without additional training. However, producing comprehensive human capital resources is not an easy mission for HLIs (Hanapi and Nordin, 2014). One participant has stated, "it is not easy to train a student with zero knowledge and transform them into a competent person...but the performance outcomes, positive or negative, may depend on how graduates absorb and optimise their knowledge for real work-life" (R2). Other participants have stressed that students who have a critical attitude would critically perform as is required by the industry: "university is a platform to produce and prepare a student with basic knowledge…industrial workplace is a platform to practice and polish their knowledge and skills" (R5).

Furthermore, the Ministry has suggested that the industry should be forthcoming with a list of attributes so that the university can design a curriculum that addresses the requirements of industry demands (Ministry of Higher Education, 2012). This suggestion agrees with the Quality TVET Graduates alternatives that focus on developing skilled talent through industry engagement to lead curriculum design and coordination across the Ministry's various TVET providers to eliminate the duplication of programmes offered in HLIs (Ministry of Education Malaysia, 2015). The overall responses to the interview questions about the need for industry's attributes have been very positive. The results of the interviews indicate that in terms of academic qualification and knowledge, BSr students are trained with all the requirements that have been set by the Ministry.

The learning outcomes of this programme have fulfilled the MQA requirement and have always received revision from the industry. However, lecturers are still concerned whether students are able or not to place themselves in the industrial market and how well students will demonstrate their capability and competency. One participant has responded that further research on BSr competency is necessary due to the competency elements in the eight domains of learning outcomes and five clusters of learning outcomes that are outlined in the MQF 1st and 2nd edition document being too general and are not specifically focused on BSr graduates.

4.3 Interview Sessions with Experienced Building Surveyor Practitioners

Employability is a classic problem faced by employers when hiring new employees among entry-level graduates. The participants claimed that entry-level graduates mostly did not function in accordance with what employers expected. The problems that are faced by entry-level graduates in performing their roles and tasks are as discussed in Table 4. All the study participants have expressed that the level of competence among entry-level building surveyor (graduates) is unsatisfactory due to the lack of attribute skills in both technical and non-technical skills. The industry experts' expectation is for skilled graduates with appropriate communication skills, problem-solving skills, and proficiency in the English language. The prospective graduates should also equip themselves with a high confidence level, and be able to work independently with a minimum guideline and without requiring detailed instructions from the employer. When the participants were asked about the performance of other graduates from different disciplines, the majority commented that most of the graduates faced the same problems as the BSr graduates, especially in the aspects of technical skills: "graduates must master the related equipment, tools, or digital technologies that are commonly used in carrying out

surveying services and tasks" (R1). Graduates are advised to master the terminologies of building elements, building defects, and building material in addition to having a proper working practice.

Table 4 - Interview summary with experienced building surveyor practitioners.

Key Issues/Themes	Lecturers' Interview Findings
Problems faced by graduates in performing their roles and tasks	**Non-technical competency** 1. Lack of confidence level (R2, R3, R4, R5) 2. Communication skills (R2, R4, R5) 3. Not independent (R1, R3, R4) 4. Problem-solving skills (R2, R4) 5. Language proficiency especial in the English language (R1, R3) **Technical competency** 1. Lack of exposure to the latest surveying equipment/tools/digital technologies (R1, R2, R3, R4) 2. Lack of terminology of building elements, defects, and building material (R2, R3, R5) 3. Improper working practice (R4, R5)
The performance of building surveying graduates	1. "…graduates are not exposed with current tools used in performing BSr works…need to understand the industry requirement…expose student with latest tool/equipment…how to use, what to used when performing survey work" (R1) 2. "Performance…comply…but need to enhance confidence level, must know the building component…can improve their employability by attending the workshop" (R2) 3. "Not properly trained…too much focus on design…not confident, not independent…unable to identify the defect, type of material" (R3) 4. "University already supply all knowledge…the problem is student itself…did not know how to used that knowledge…have no skills to solve the problems" (R4) 5. "Average…students trained with basic knowledge, less of experience, but it is okay because they have a basic…not sure what should do during the inspection" (R5)
The necessity of industry's attributes	1. "Standard, do not have it…we have three code of practice…maintenance, dilapidation and building condition assessment…it is necessary" (R1) 2. "We need the guideline…it required to set up this profession direction, with proper manner…we need the Act to endorse our code of practice, role and tasks…without Act or standard, people might confuse" (R2) 3. "Necessary…we have code of practice, building condition assessment…need to declare our roles and what attributes we need to equip in performing our role" (R3) 4. "Yes, agreed…we need that specifications on the required attributes" (R4) 5. "Required…BSr have code of practice, but have no standard on attributes" (R5)

Furthermore, there is a similar perception between the lecturers and industry practitioners about the performance of BSr students and entry-level building surveyor, as summarised in Table 5. The competency issue commonly occurred in terms of non-technical skills, e.g., communication skills, confidence level, problem-solving skills, and language proficiency. Most of the graduates lack the attribute of confidence to approach clients, owners, or other professionals, which reflects a lack of communication skills among them. Other participants have stressed that graduates lack the leadership attribute as they are still not confident to work independently in performing their given tasks. In terms of technical competency, most of the graduates lack an ability to identify the terminologies of building elements, defects, and material even though it is a core course that is outlined in their learning outcomes. There is also an inclination angle where the BSr students have mentioned that they still lack technical practice skills, and need more exposure to conduct real surveying work, as well as the need for guidance to implement and recognise the current equipment or tools or digital technologies that are used in the BSr industry. This circumstance is due to the lack of basic knowledge in the BSr programme among the first-semester students, and to the lack of exposure to the latest surveying equipment or tools that are previously in their learning stage. Despite these significant problems, the experts believed that the competency level of BSr graduates could be enhanced through involvement in additional training or seminars, and a long journey of their employment phase.

Table 5 - Triangulation perspective on the mismatch of supply and demand of non-technical competency and technical competency.

Element of mismatch	Triangulation perspective		
	Supply		Demand
	Students	Lecturers	Industry
Non-technical competency			
1. Communication skill	√	√	√
2. Presentation skill	√	√	
3. Teamwork skill	√	√	
4. Leadership skill	√	√	
5. Confidence level	√	√	√
6. Problem-solving skill	√	√	√
7. Language proficiency	√	√	√
8. Information and source management		√	
9. Time management		√	
10. Students' attitudes		√	
11. Independent level			√
Technical competency			
12. The real practical on how to carry out surveying works	√		
13. The terminology of building elements, defects, and building material	√	√	√
14. The technical knowledge of building construction	√		
15. Technical skills and knowledge in building surveying fields for first-semester students from different field of studies		√	
16. Technical knowledge, especially on town planning and building pathology subjects		√	
17. Awareness of the building surveyor roles and tasks		√	
18. Exposure to the latest surveying equipment/tools			√
19. Improper working practice			√

Subsequently, a survey conducted by MOHE in 2012 showed that several issues were faced by employers when hiring fresh graduates, for instance, job mismatch, lack of science and technical graduates, and the lack of qualified graduates with technical skills (Ministry of Higher Education, 2012). Interestingly, the same predicaments are faced by building surveyor employers when employing entry-level building surveyors. Thus, the industry practitioners mentioned that this problem should be appropriately resolved to sidestep the continuing argument about BSr graduates' capabilities, among other construction professionals (Ali & Woon, 2013). When the participants are asked whether the industry requirement should be a list of attributes as references for the university, a majority of them commented that it is desperately needed. Therefore, further research is required to identify the specific skills and attributes required for the BSr industry. Consequently, as a technical graduates provider, a close collaboration with the industry is essential to shape a set of skills and the training curriculum to be in accordance with the industry requirements, as aligned with TVET shift initiatives.

5. Conclusions

The learning outcomes of the BSr programme consistently fulfilled the industry's requirement, which followed the TVET initiative in producing quality technical and vocational graduates with an updated training structure. The continuing collaboration with industry participants in reviewing their syllabus is one of the brilliant approaches from both parties towards enhancing student quality. However, the debate concerning BSr graduates' capabilities and performance by other construction professionals and employers continues. It has also become an issue of concern among lecturers and building surveyor experts. The study presented thus far has provided evidence that there is a mismatch between supply and demand of BSr graduates' skills. It is apparent from the findings that several major predicaments are reflecting the current graduates' performance respectively, as has been discussed earlier. While the lecturers claim that BSr students are trained with the relevant syllabus that is required by the industry, the employers have a few arguments about the skills and performance of entry-level building surveyors. Constituted within this perspective, there is a massive expectation for the students to possess both technical and non-technical skills as a platform in bridging the industry requirements in the same vein.

Interestingly, the students and lecturers have also mentioned the same concern regarding the inadequate skills and attitudes in performing an assignment and practical training programme. The triangulated correlation between the students, lecturers, and building surveyors' perception is interesting because they express the same problems concerning both technical and non-technical skills. Collectively, this study outlines a mismatch in the supply and demand of BSr graduates' skills. Strong evidence of mismatch in supply and demand has been identified when the study results among the industry respondents have indicated that there are inadequate skills among entry-level building surveyors or graduates in both technical and non-technical skills. Furthermore, there were also consistencies in the students and lecturers' perception who have mentioned the same side of problems concerning students' skills in performing their assignment and tasks. Overall, the study has suggested that BSr graduates should acquire and demonstrate non-technical and technical skills demanded by the industry. Accordingly, the present study makes several noteworthy contributions to improving the programme learning outcomes and students' skills. Therefore, further research is suggested to identify entry-level BSr graduates' competency level in real working practices.

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