Appraisal of the Competency Gap between UOM Quantity Surveying Degree Programme and IQSSL Competency Standards

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Abstract

Quantity Surveying is one of the prominent professions in the construction industry which fulfils varied and comprehensive duties to support cost-effective construction and property development. Thus, Quantity Surveyors (QSs) should adorn with competencies to deal with complex situations in the construction industry. The Quantity Surveying profession has become an emerging profession due to the increasing number of Quantity Surveying degree programmes offered by many Sri Lankan institutions. However, many construction professionals claim that Quantity Surveying education in Sri Lanka has not distinguished the actual needs of the profession, thus the graduates are presumed to not being up to the standards expected by the industry. Institute of Quantity Surveyors Sri Lanka (IQSSL) is the local professional organization that has set out competency standards for QSs under the Act of parliament. Assessment of Professional Competency (APC) is being evaluated by the IQSSL. IQSSL will only accredit any degree programmes which comply with specified competencies. On the other hand, the University of Moratuwa (UOM) is one of the government institutions that conduct the Quantity Surveying education in Sri Lanka and IQSSL has accredited its degree programme. Thus, this study intends to ascertain to which extent the IQSSL competency standards are being satisfied by the UOM Quantity Surveying degree programme to address the above claim of industry practitioners. To attain the aim, an extensive literature synthesis was piloted to develop a theoretical competency mapping framework upon the key findings of the literature. This research outlines a 'competency' as the ability of an individual to follow a set of professionally agreed standards. Due to the rapid evolvement and complexity in the construction industry, it is much required to enhance QSs' competencies. The literature synthesis identified that the UOM's

competencies are slightly different from IQSSL competency standards. Hence, the research outcome has successfully argued that there is a competency gap between the UOM Quantity Surveying degree programme and IQSSL standards through competency mapping techniques. Thus, identifying such a competency gap would enhance any knowledge requirement of the UOM graduates in line with the construction industry.

Keywords: Competency, Quantity Surveyor (QS), Institute of Quantity Surveyors Sri Lanka (IQSSL), University of Moratuwa (UOM), education

INTRODUCTION

Construction is a unique work influenced by socio-cultural, political, and economic factors (Wao and Flood, 2016). Due to the competition of the industry, construction professionals must play diversified roles to meet its contemporary requirements (Chandramohan, Perera, and Dewagoda, 2020). According to Nkado and Meyer (2001), QS plays a prominent role in the construction industry on the time, cost, and quality of a project. Therefore, competent QSs should have skills and understanding to apply in a range of functions (Ekundayo, Zhou, Udeaja, Pearson, and Perera, 2015). As reported by Hassan, Ismail, Zaini, Hassan, and Maisham (2011), Quantity Surveying firms expect the graduates to be competent for undertaking a wide range of Quantity Surveying tasks according to the industrial situations. Therefore, acquiring appropriate knowledge, experiences, and competencies, before graduation and link with the industry will help to bridge the competency gap (Lian, Foo, and Ling, 2018). Accordingly, the academic institutes related to Quantity Surveying education are mainly designed to conform to the requirements of the Quantity Surveying education frameworks outlined by several global and local institutions (Hassan et al., 2011). IQSSL is a professional organization in Sri Lanka that has established competency standards for QSs under the Act of parliament. It focuses generally on areas related to Quantity Surveying along with targeted achievements. Moreover, the UOM is the first government university that conducts the Quantity Surveying degree programme in Sri Lanka and IQSSL accredited the UOM Quantity Surveying degree programme. Therefore, it is essential to evaluate whether there is any competency gap between the Quantity Surveying degree programme at the UOM and IQSSL competency standards for the betterment of Quantity Surveying graduates who are passing out from the UOM. Even though past research have been done on competencies of the Quantity Surveying profession in both international contexts and the local context, the investigation for any competency gap of Quantity

Surveying UOM degree in line with IQSSL standards has not yet been addressed. Hence this study will fulfill this contemporary research gap.

COMPETENCIES OF QUANTITY SURVEYING PROFESSIONALS

In recent years, there has been a long discussion over improving the performance of industry practitioners to meet the increasing demands being placed on the industry (Dainty, Cheng, and Moore, 2004). Moreover, the poor performance in a country's economy would result in a productivity decline and a high level of inefficiency in the construction industry as well (Ofori and Debrah 2005). Therefore, the role of competency-based performance is significant for the construction industry (Dainty et al., 2004). The constantly changing nature and complexity of work distinguish the construction industry as a prominent sector from other industries and it has caused an expansion of the roles of QSs as well (Oke and Otasowie, 2020). The expanded scope of QS roles is ranging from construction measurement to Contract administration or Arbitration (Perera, 2011).

Further, Deist and Winterton (2005) have expressed the competency as a characteristic of a person that has been shown to drive superior job performance. Competency level is the main factor in reviewing a judgment and operation based on a profession (Bello, Iliyasu, Kuna, Ibrahim, and Adekunle, 2020). Thus, it is crucial to identify and develop suitable competencies to measures performance towards an effective professional team. (Kwofie et al., 2016). Furthermore, Yik, Lai, Chan, Chau, and Lee (2013) noted that the discrepancy of competencies in the construction industry will be bridged by the constant development of professional competency. Debrah and Ofori (2005) highlighted that professional and management competencies as a possible weapon to overcome competitive forces and globalization in the construction sector.

The competencies are required for QSs to address conflicting and varying client needs (Nkado, 2000). As in whole QSs should be aware of the construction market conditions for the effective execution of any construction project (Hiew and Ng, 2010). In another perspective, Wao and Flood (2016) observed that there should be a high level of accuracy in decision making for the QSs to be trusted, unlike the other construction professionals. Therefore, the core competencies expected from QSs are necessary for a broader practice of the profession (Dada and Jagboro, 2015). As Shafiei and Said (2008) stated, the most important competencies for QSs are quantification/measurement, analysis, and interpersonal skills.

RESEARCH METHOD

Whilst the construction industry plays a crucial role in a country's economy, a boom or a downturn in the industry can be created at any time. The downturn of the construction industry causes to lay the graduates' jobs in an uncertain situation. Thus, professionals in the construction industry should adorn with competencies to deal with any kind of situation, particularly QSs, because they play an important role within construction projects. The Quantity Surveying profession has become an emerging profession due to the developing number of Quantity Surveying degree programmes in many institutions in the country. However, the Quantity Survey education system did not sufficiently consider so far, the needs of the profession; thus, the Quantity Surveying graduates are deemed not to reach the industry's anticipated requirements in the current crisis. As the only local professional organization that has set out competency standards for QSs, IQSSL can be taken as a professional competency standard. Moreover, the UOM is the first government institution that conducts the Quantity Surveying degree programme in Sri Lanka. Thus, for the betterment of Quantity Surveying graduates who are passing out from the UOM, this research was conducted to ascertain whether there is any competency gap in UOM QS graduates based upon the competency standards published by the IQSSL.

A comprehensive literature survey was carried out by reviewing the IQSSL competency guidelines relating to Quantity Surveying education and the UOM Quantity Surveying degree programme's learning outcomes. Further peer-reviewed journal articles; textbooks; official web pages and other online work were referred to do an extensive literature review. Eventually, the outcomes of the extensive literature synthesis were illustrated through a competency mapping framework to highlight any overlapping of competencies in the UOM Quantity Surveying degree and IQSSL competency standards.

Competency Mapping Technique

The theoretical framework was developed while going through the literature, which explains the significance of the research problem (Kumar, 2011). Without a theoretical framework, the structure and vision for a study were unclear (Osanloo and Grant, 2016). Therefore, information gathered for research is required to always be interpreted through a theoretical framework to offer a clear explanation of what has been found (Sarter, 2006). In this research, a theoretical competency mapping framework is constructed to illustrate and represent organized ideas to grab the desired outcome.

LITERATURE SYNTHESIS

Quantity Surveying Profession

It is believed that the ancient Egyptians used a system of Quantity Surveying and it was developed during the 19th century from the earlier (Rathnayake and Samir, 2019). According to Shafie, Syed Khuzzan, and Mohyin, (2014), the QS's role in the construction industry had existed since ancient Egyptians time to carry out estimates and costing for their building works. Controlling the costs of the project from commencement to completion is the foremost role of the Quantity Surveying profession (Zainudeen, Palliyaguru, and Nirooja, 2011). In such a way, the QS should diversify his/her role as a key professional in the industry to meet the rising demands of clients and changing business environments (Chandramohan et al., 2020).

Roles of a Quantity Surveyor

According to Reddy (2015), qualified QSs have numerous options to gain employment and involve in a wide range of activities. Meanwhile, the role has diversified in the present day from just financial budgeting to include risk allocation, contracting documentation, legal advisor, value management, project management, and others related (Oke and Otasowie, 2020). Wao and Flood (2016) have stated that it requires the variation of the roles played by professional QSs to ensure their position in the emerging construction market in the developing economies. In such instances, roles played by QSs have now broadened beyond their traditional roles to provide technical and specialist services (O'Brien, Mbachu, and Lomax. 2014). Since the Quantity Surveying profession has now passed the taking-off era, the QSs must diversify their roles to meet the rising expectations of their clients (Chandramohan et al., 2020). Further, Reddy (2015) summarized the basic roles of the QSs under Client and contractor organizations.

Table 1: Roles of a Quantity Surveyor

Client's Quantity Surveyor	Contractor's Quantity Surveyor

▪ Prepare early cost estimate prior to construction ▪ Advice on appropriate procurement strategies ▪ Prepare Bills of Quantities (BOQs) ▪ Evaluate tenders and tender negotiation ▪ Cost planning ▪ Value Engineering services ▪ Monitoring project cost and cash flow ▪ Lifecycle costing ▪ Technical Auditing and taxation ▪ Dispute resolution	▪ Cost planning for various Contractor activities ▪ Preparing of precise detailed information for Contractor activities ▪ Pricing BOQs ▪ Finalizing of measurement details with Client QS ▪ Maintaining of project progress database ▪ Administer conditions of Contract ▪ Cash flow forecasting ▪ Dealing with subcontractor payment ▪ Advising on the economical procedure ▪ Dispute resolution

Source: (Reddy, 2015)

Moreover, Yogeshwaran, Perera, and Ariyachandra (2018) have identified the roles of a professional QS, by reviewing internationally recognised professional bodies, implying that even though QS can perform roles in other industries, the construction industry needs the competencies of QSs for the most, as follows;

- Traditional role – in construction projects as the client's QS, the consultant's QS, and the contractor's QS.
- Contemporary Role – the role of a QS in industries other than the construction industry such as finance, insurance, taxation/valuation, and manufacturing

The construction industry in the future will require them to go beyond their traditional duties and become involved in whole life costing, sustainability, facilities management, investment appraisal, and value management, which will require them to have considerable Information Technology (IT) skills (Yogeshwaran et al., 2018).

Academia and industry practitioners in Quantity Surveying

Academics are interested in producing a rounded graduate with the fundamental basis of knowledge for further advancement, whereas professional bodies are interested in graduates who can be advanced to full professional status by achieving the requisite core competencies (RICS, 2009). The investigations related to the views of the industry and academia on Quantity Surveying education revealed that there is a considerable gap in the expectation of graduates' competencies and the

achievement of it (Perera, Pearson, Zhou, and Ekundayo, 2012). Thus, it is crucial to investigate the competency levels before moving to the industry as practitioner. Academia should organize proper and adequate training, workshops, and seminars to foster the possibility of acquiring more skills to improve competencies in the Quantity Surveying duties. The researchers have established a need for academia and industry practitioners to have a better mutual understanding of creative project execution and opportunities in the construction industry (Jackson, 2009). In academia and industry practitioners, there is a potential disparity in some of the competencies required for the profession (Jackson, 2009).

The need for 'Competencies'

‘Competency’ is used to refer to the dimensions of competent performance as a person-related concept (Dainty et al., 2004). Anyone indicating competence in a role can work at an acceptable level equivalent to peers in that job (Austin, 2019). Hodges and Still (2017) noted that awareness of competency has matured over time, and the approaches of competency in education, regulation, and employment have been evolving. Accordingly, competency has developed as a core focus for understanding the attributes of industry experts in the above-mentioned areas (Austin, 2019). Industry practitioners work within the construction industry by applying formalized professional techniques that were systematically trained (Cheetham and Chivers, 1998). Dainty et al. (2004) made a clear definition of 'professional competence' as a description of something that a person who works in each occupational area should be able to do. As well as it is suggested that academia as well as practitioners must develop their technical knowledge to meet the current and future demands of the profession (Kwofie, Abanyie, and Botchway, 2016).

Professional competency standards

Educational competency standards will help to improve academic, teaching, and assessment strategies (Hager, 1995). According to Yogeshwaran et al. (2018), professional bodies have listed the core competencies expected of QSs to the highest standards of professional excellence. The Quantity Surveying profession in Sri Lanka is governed by IQSSL while other professional associations, namely RICS, AIQS, and PAQS also associate with the Quantity Surveying profession [Australian Institute of Quantity Surveyors (AIQS), (2012)]. These professional bodies have precisely outlined pathways to verify their members are competent to conduct Quantity Surveying standards of professionalism (Yogeshwaran et al., 2018).

IQSSL Competency standards

IQSSL accredits Quantity Surveying undergraduate degree programmes, with a specialist focus on the technical level and other key requirements. Each degree programme is considered on its merits

[Institute of Quantity Surveyors Sri Lanka (IQSSL), (2016)]. The academic institutes shall satisfy that their graduates from the programme will meet IQSSL Competency Standards (IQSSL, 2016). The core skills and competencies are identified with the integration of subjects, and the module system. (IQSSL, 2016). IQSSL will grant accreditation to a programme for up to three academic years and all accredited programmes are monitored annually (IQSSL, 2016). Following competency areas are evaluated by the IQSSL under APC (IQSSL, 2014).

1. Cost Management
2. Cost Estimation
3. Contract Administration
4. Cost Reporting
5. Procurement Advice
6. Construction Technology and Building Services
7. Specialized Areas

Academic institutes are encouraged to obtain feedback from the Institute of Quantity Surveyors, Sri Lanka (IQSSL, 2016). IQSSL will only accredit programmes that comply with competencies specified by them. Academic institutes shall meet the requirements with the necessary documentation to enter the accreditation process. The submission shall consist of: programme details, critical review of the programme (Mapping of programme contents with competencies specified by IQSSL), internal review documentation, changes during the period under review (only for a re-accreditation), response to comments made in last accreditation report (only for a reaccreditation). The submission shall consist of: programme details that should be covered for accreditation. Because some of these competencies have a limited academic framework and can only be achieved through practical experience built upon structured education (IQSSL, 2016). However, it is expected that at least 70% of the compulsory content of the programme would address competencies specified by IQSSL (IQSSL, 2016).

Quantity Surveying education

Since the role of QSs in the construction industry is predominant, the Quantity Surveying education must be more precise. Yogeshwaran et al. (2018) assumed that Quantity Surveying education must cater to the industry needs, to produce graduates who can compete with their colleagues, and meet industry expectations. The construction industry requires graduate QSs to involve in their day-to-day

business functions by properly managing their programmes to their growth (Perera, Pearson, and Ekundayo, 2011). According to Pheng and Ming (1997), a Quantity Surveying education program should have a sound theoretical base and practical base as QS may have to work in a variety of different settings and many aspects of the profession. Similarly, Greenhalg (2013) has noted that most of the degree programmes in Quantity Surveying will be a 04-year degree and the first couple of years would have to concentrate on technical issues and later on in-depth research on main subjects, and professional skills. Ofori and Toor (2009) have indicated that proper Quantity Surveying education will concentrate on generating professionals who can face the demands of the 21st century by converting education to match needs. However, according to Yogeshwaran et al. (2018), Quantity Surveying education in Sri Lanka does not appear to be catered to the industry needs indicating that it may not be up to the expected standard.

Competencies expected from Quantity Surveying education

The industry is looking for a graduate who can straight away contribute to the daily functions of business activities and its growth (Perera et al., 2011). Thus, it is important to ascertain what competencies are perceived by QS graduates in the construction industry (Perera, Babatunde, Pearson, and Ekundayo, 2017). Moreover, Jackson (2009) insisted that higher education institutions are consistently blamed for soft skill deficiencies and they are now pursuing competencies in the development of generic skills. Accordingly, Ashworth, Hogg, and Higgs (2013) have stated that to practice and develop the profession, a QS requires a sound knowledge based on construction technology, measurement rules and conventions, construction economics, financial management, business administration, construction law and a sound skill base on management, documentation, analysis, appraisal, quantification, synthesis and communication. Educational institutions assume that their students should have the competencies only identified by regulatory bodies (Perera, Pearson, and Dodds, 2010).

According to investigations of Shafiei and Said (2008), the graduates should possess the following competencies through the Quantity Surveying education programme.

Table 2: Expected competencies from a graduated Quantity Surveyor

Main criteria	Competencies

Meta-competencies	Versatile and adaptable Pro-active and positive thinking Able to communicate effectively High self-esteem Highly creative and innovative Able to work in team High ethical
Construction economics	Project cost estimating and cost plans Preparing project budget and cash flows Administration of project cost and finance Carrying out feasibility and viability studies
Management of construction project procurement and contract	Identifying, collecting, processing, and interpreting data Selection of appropriate procurement system Contractual arrangement Preparing tender and contract documents Administration of tendering processes
Measurement, quantification and documentation	Measuring and quantifying construction works for project costing Cost planning and control Preparation of bills of quantities, work programme Resources planning and control, valuation for interim payment Preparation of project account.
Construction technology and engineering	Use of construction technology and engineering Knowledge of materials, plant, machinery, and manpower in quantity surveying functions Cost and financial management Contract administration.
Information and communication technology	Utilise the latest ICT Design and/or develop systems for quantity surveying work, processes, and procedures
Project management principles and practice	Providing quantity surveying services Management of project cost, finance, procurement, and contract
International QS practice	Use local and international construction quantity surveying technology, work process and procedure, and their changes and development.

Source: Shafiei and Said (2008)

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UOM Quantity Surveying degree programme

The Sri Lankan Qualifications Framework (SLQF) is an essential element in the advancement of frameworks in the higher education sector, which essentially provides a coherent framework for learners to refine their lifelong learning objectives while enhancing many critical aspects of learning and evaluating the learning process. (Ministry of Higher Education, 2012). SLQF consists of ten levels, and with each level, the demand for learning results and learning complexity expands, while the first two levels (levels 1-2) are senior secondary level education qualifications, the next four levels (levels 3-6) are undergraduate qualifications, and the other four levels (levels 7-10) are postgraduate qualifications (Ministry of Higher Education, 2012). Honours Bachelor's Degree designators are coming under SLQF level 6 with having the main purpose of preparing students for research-based postgraduate studies. The minimum admission requirement is the General Certificate of Education (Advanced Level), or Completion of NVQF level 7, or an equivalent qualification and completion of 90 credits at SLQF Levels 3, 4, and 5 with a minimum of 15 credits at SLQF Level 5 in the relevant field. Completion of Honours Bachelor's Degree reaches the minimum entrance requirement for admission to SLQF levels 7,8,9 and 10 according to Sri Lankan Qualifications Framework (Ministry of Higher Education, 2012).

Sri Lankans practiced foreign education as QSs until the BSc (Hons) in Quantity Surveying started at the UOM in 1985 (Amaratunga, Ginige, Hemajith, and Perera, 2007). BSc (Hons) in Quantity Surveying degree is one of SLQF level 6 Honours Bachelor's Degree designators, which It has been conducted to attain a broad education that empowers graduates with the knowledge, technique, and skills in a specific discipline, allowing them to receive licenses from relevant professional bodies to demonstrate responsibility in a professional manner. This was the only institute to offer a 04 year BSc honours degree programme for Quantity Surveying and very recently other state and private institutions have started to offer similar programmes. The curriculum of the programme includes core Quantity Surveying subjects and 32 weeks of industrial placement. Moreover, this educational programme has been accredited by not only the local body for Quantity Surveying, which is IQSSL, but also RICS, AIQS, and PAQS. It should be noted that IQSSL had accredited the UOM, BSc Hons (Quantity Surveying) four (04) year degree programme from its first batch that graduated in 1991 (IQSSL, 2014). Quantity Surveying undergraduates of UOM to be placed for industrial training shall be after completion of level 2(02 years) of the degree programme from the Department of Building Economics, UOM (Senarathne and Pasqual, 2011). In the UOM Quantity Surveying degree programme, the training component is pre-planned. Further, these programme includes a research project in the field of specialization carried out under the guidance and supervision of a qualification holder of SLQF level 8, 9, or 10 and reporting in a manner of a dissertation, which will be assessed (Ministry of Higher Education, 2012).

Competencies of UOM Quantity Surveying undergraduates

Since the UOM competencies are not available in published journals, a documentary review was conducted to collect them. UOM Quantity Surveying degree programme has assigned learning outcomes for each module and there is no separate document for competencies. Therefore, relevant competencies were obtained via analysing those learning outcomes systematically. The competencies were gathered under 8 streams including

1. Construction Costing
2. Construction Costing
3. Procurement Management
4. Procurement Management
5. Management Studies
6. Management Studies
7. Legal System
8. Legal System

According to the course structure, Quantity Surveying student of the UOM Quantity Surveying degree programme will acquire Quantity Surveyors' wide range of competencies throughout four levels. Total competencies covered under the UOM Quantity Surveying degree programme at the graduation set out by listing the competencies required of QSs in 8 streams as previously mentioned and each stream comprises a range of competencies to enhance the undergraduates' performance.

DEVELOPED THEORETICAL COMPETENCY MAPPING FRAMEWORK

The theoretical framework is an excellent way to offer an introductory structure of understanding of how the research topic will be approached (Osanloo and Grant, 2016). On the other hand, it is an excellent way to offer an introductory structure of understanding of how the dissertation topic will be approached (Osanloo and Grant, 2016). Further, based on the review, this paper proposes a conceptual model that shows the relationship between UOM Quantity Surveying degree programme and IQSSL competency standards. This specific theoretical framework was chosen since it explains the potential value of this study and helps to determine the audience for this study as well. The use of a theoretical framework is not limited to problem formulation and the literature review, it guides the study throughout the dissertation (Osanloo and Grant, 2016). Under the development of the competency mapping framework, review the literature, and organize key items related to the topic as Quantity Surveying profession, competency requirement of QSs, and professional competency standards. Next, arrange those ideas in a hierarchical, logical structure by starting with general ideas

and funnel the thinking down to more specific, related topics. Each topic has a clear purpose and significance with the topic.

A clear picture can be seen by reviewing the structure with visual arrows, and boxes among concepts and identifying the headings of this framework. Moreover, the following framework describes how does the theoretical framework emerges or connects to the problem? Identification of conflicts and gaps in the literature could be accomplished through developing this map. The IQSSL competency standards were derived through professional competency standards as indicated here. However, at the end of the literature review, it is understood that there is a gap between the UOM Quantity Surveying degree programme and IQSSL competency standards since each competency is not matching as depicted in Figure 1.

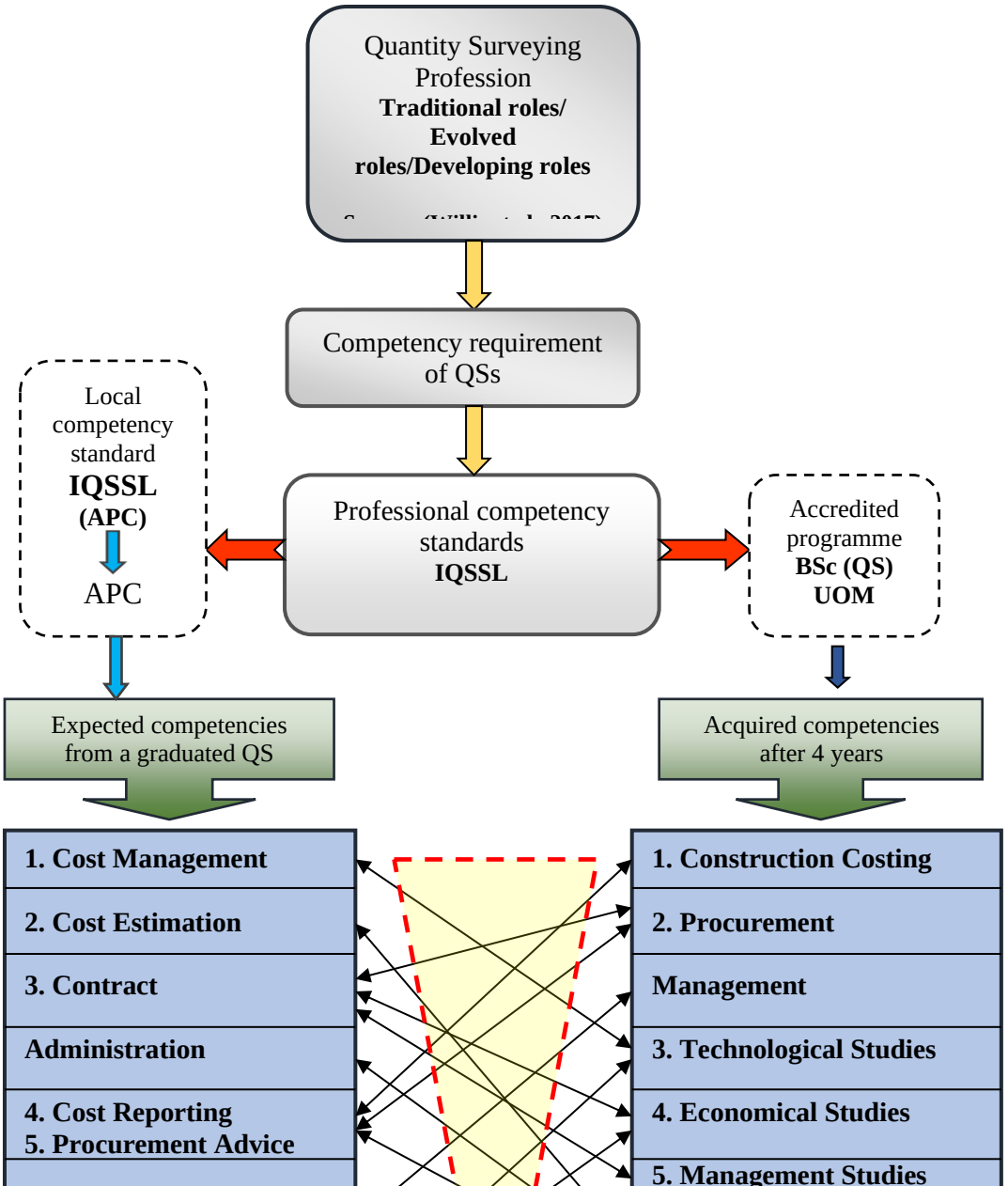

Figure 1: Theoretical competency mapping framework

CONCLUSION AND RECOMMENDATIONS

A broad range of professionals engaged with operations of the construction industry. Each construction professional must be carefully practiced since they are responsible for any fault that occurred during the construction. Therefore, the development of competitive skills and competencies is required by practitioners in the construction industry to operate effectively to maintain the level of productivity. 'Competencies' can be defined as a work-related concept that characterizes the areas of work or profession at which a person needs to be competent. The concept of competency is frequently used in education including training and Continuous Professional Development (CPD). Moreover, competencies have been stably placed at the selection of industry practitioners in professional construction practices.

Academics and researchers have identified various competencies that should be earned through Quantity Surveying education. The necessity of conducting this research was confirmed since very few researchers have investigated this gap. Accordingly, a theoretical competency mapping framework is developed to provide a clear picture of the subject matter and to understand how the research has been assembled. The conclusion of the developed framework suggested that the UOM's competencies are slightly different from IQSSL competency standards. Hence, the research conclusion has successfully argued that there is a possibility of a competency gap between the UOM Quantity Surveying degree programme and IQSSL standards through competency mapping techniques. Ultimately this review proposed a theoretical competency mapping framework that will be helpful in the future to factually evaluate possible prepositions in this study.

Exploring and evaluating the competency gap between the UOM Quantity Surveying degree programme and IQSSL standards is a complex research process. In this paper, only the possibility of a competency gap has been addressed as a brief output from the literature review. Therefore, this outcome is a basic part of a huge research process. Through undertaking further analysis beyond this competency mapping framework in further analysis, it may be possible to declare the corresponded competencies, and extra competencies between the UOM Quantity Surveying degree programme and IQSSL competency standards in a detailed manner. Therefore, further investigations regarding the competency gap will be addressed in the final parts of this research.

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