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17TH RISM INTERNATIONAL SURVEYING CONFERENCE FOR UNDERGRADUATES

**Embracing Construction Revolution
4.0 (CR4.0): Transforming Malaysia's
Built Environment**

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WELCOME SPEECH FROM THE CHAIRMAN

RISM 17th International Surveying Conference for Undergraduates (ISCU 2025)

بسم الله الرحمن الرحيم السلام

عليكم ورحمة الله وبركاته

Greetings to all,

It is with great pleasure that I welcome you to the 17th RISM International Surveying Conference for Undergraduates (ISCU 2025), themed “*Embracing Construction Revolution 4.0: Transforming Malaysia’s Built Environment*.” On behalf of the Royal Institution of Surveyors Malaysia (RISM), I also wish to express our sincere appreciation to Universiti Teknologi MARA (UiTM), Perak Campus, for graciously hosting this significant event.

As we navigate the era of the Fourth Industrial Revolution (IR4.0)—or in our context, Construction Revolution 4.0 (CR4.0)—we are witnessing transformative advancements across the global construction sector. Technologies such as Building Information Modelling (BIM), the Internet of Things (IoT), artificial intelligence (AI), robotics, big data analytics, and cloud computing are redefining the way we build, manage, and interact with our built environment. For Malaysia, embracing CR4.0 is a strategic imperative to achieve our socio-economic and environmental goals.

This conference serves as a vital platform to unite surveying undergraduates from various disciplines, fostering critical dialogue on industry challenges, enhancing professional networking, and preparing a new generation of talent for the rapidly evolving construction landscape. It is also an opportunity for employers to engage with and inspire our future professionals.

I would like to extend my heartfelt thanks to all industry speakers, paper presenters, judges, and participants for their time, contributions, and support in making ISCU 2025 a success. I also commend the organising committee for curating a meaningful and dynamic conference experience.

May the knowledge gained, connections formed, and ideas exchanged during this event inspire all participants to lead and innovate in their future endeavours.

Wishing everyone a productive and memorable conference.

Prof. Ts Sr Dr. Adi Irfan Bin Che Ani'

Chairman, Universities' Partnering Committee

RISM Session 2024/2025

May 2025

WELCOME SPEECH FROM CO-CHAIRMAN

RISM 17th International Surveying Conference for Undergraduates (ISCU 2025)

Bismillahirrahmanirrahim.

السلام عليكم ورحمة الله وبركاته and greetings to all.

It is my great pleasure to welcome everyone to the 17th International Surveyor Conference for Undergraduates (ISCU 2025), proudly hosted by Universiti Teknologi MARA (UiTM) Perak Branch in collaboration with the Royal Institution of Surveyors Malaysia (RISM). This event is a meaningful platform for students in the built environment to share ideas, showcase innovations, and build professional networks. We are honoured by your presence and enthusiastic participation, with 135 accepted papers and 78 poster presentations this year.

UiTM Perak, home to the College of Built Environment, has long been a hub for academic excellence in architecture, planning, and surveying. Our commitment remains strong in nurturing competent graduates who meet industry demands and contribute to nation-building.

While you're here, we invite you to experience the heritage and culture of Perak Tengah from the architectural richness of Rumah Kutai to the historical towns of Pasir Salak, Bota, and Kampung Gajah.

To all presenters and winners, congratulations on your achievements. Let your work today be a catalyst for future success and academic growth. We hope this conference will inspire you to explore new ideas, foster collaboration, and make lasting memories.

My deepest thanks to the Royal Institution of Surveyors Malaysia (RISM) and the organising committee for making this event a success.

We hope your experience here will be rewarding and unforgettable.

Thank you. Selamat datang dan selamat berjaya.

Associates Professor Dr. Nur Hisham Ibrahim, *PMP*
Co-Chairman, Universities' Partnering Committee
RISM Session 2024/2025
May 2025

WELCOME SPEECH FROM THE PROJECT DIRECTOR

RISM 17th International Surveying Conference for Undergraduates 2025

Alhamdulillah, all praise to Allah S.W.T. for His guidance and blessings in making the RISM 17th International Surveying Conference for Undergraduates (ISCU) 2025 a reality.

It is with great honour and gratitude that I welcome all participants, guests, academicians, and industry professionals to this prestigious event, proudly organized under the Royal Institution of Surveyors Malaysia (RISM). This 17th edition of ISCU stands as a proud testament to our collective dedication toward academic excellence, professional collaboration, and youth empowerment in the field of surveying.

I extend my heartfelt appreciation to RISM for its unwavering support, to the hardworking ISCU 2025 Organising Committee, and to all 16 partnering universities across Malaysia for their commitment and contributions. Your efforts have shaped this conference into a dynamic platform for knowledge exchange, innovation, and professional growth.

To the academicians and practitioners present, your insights are invaluable in bridging the gap between academic theory and real-world practice. To our undergraduate participants, your passion, curiosity, and commitment are the very foundation of our future. May this conference not only deepen your academic journey but also ignite a spirit of leadership, integrity, and sustainable thinking.

Let this gathering serve as more than an academic milestone. May it foster lifelong networks, inspire transformative ideas, and chart new directions in our shared professional journey.

Wishing everyone a rewarding and inspiring conference experience.

Sr Dr. Nurul Fadzila Zahari

Project Director

RISM 17th ISCU 2025

STRATEGIES TO ENHANCE THE EMPLOYABILITY SKILLS OF QUANTITY SURVEYING GRADUATES IN THE SARAWAK CONSTRUCTION INDUSTRY

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ABSTRACT

As the construction industry embraces the modern era, Quantity Surveying (QS) professionals must broaden their skill sets to consistently thrive. Hence, recent QS graduates need advanced competencies aligned with evolving industry demands to remain competitive. However, many new graduates struggle to meet current expectations, owing to reluctance in adopting emerging technologies and deficiencies in critical soft skills. This study addresses a gap in research by focusing on strategies to enhance the employability of QS graduates in Sarawak, East Malaysia. Through preliminary research findings, a comprehensive literature review identified ten potential strategies to improve graduate employability. The ten findings were then comprehensively justified based on the top three strategies. Additionally, for further comprehensive research findings, the current study shall employ qualitative approach to achieve the research aim and objectives. The potential participants shall have vast industry experience and foundational knowledge that will provide insights through semi-structured interviews, selected through a snowball sampling technique, focussing to Quantity Surveying firms in Sarawak registered with the Board of Quantity Surveying Malaysia (BQSM). The collected data will then be analyzed using content analysis. The comprehensive findings aim to be the guideline for educational institutions and industry stakeholders in implementing measures that better prepare QS graduates for the Sarawak construction industry's workforce needs.

Keywords: Quantity Surveying Graduates, Skills, Employment

I. INTRODUCTION

The role of Quantity Surveyors (QS) has evolved significantly beyond traditional cost and financial management to encompass various tasks such as contract documentation, risk allocation, legal advisory, value engineering, and project management (Shafie et al., 2014). As the construction industry continues to grow and diversify, QS graduates are expected to acquire a broad range of skills to effectively meet industry demands (Tokijan & Aziz, 2023). According to Siriwardena et al. (2011), the dynamic nature of the sector necessitates continuous enhancement of skills among aspiring QS professionals to remain competitive. Employability in the QS field requires a balanced combination of hard skills, including proficiency in software tools like AutoCAD, Microsoft Excel, and Building Information Modeling (BIM), as well as strong project management capabilities essential for tasks like cost estimation and quantity take-off (Musa et al., 2010; Latiffi et al., 2015). Equally important are soft skills such as communication, teamwork, leadership, and analytical thinking, which employers highly value due to their importance in effective collaboration, problem-solving, and project efficiency (Chai, 2017). Unfortunately, many QS graduates fall short of meeting these expectations, resulting in employer disappointment and challenges in securing employment.

Despite the acknowledged importance of a balanced skill set, numerous QS graduates continue to face challenges in meeting industry expectations, primarily due to their reluctance to embrace new technologies that are increasingly

essential for enhancing efficiency and profitability within the sector (Chong et al., 2010; Kim et al., 2016). Furthermore, technical expertise alone is insufficient if graduates lack essential interpersonal skills. Malaysian employers have frequently reported that even excellent graduates often fail to demonstrate the soft skills required for workplace success (Khalid et al., 2014). As Schulz (2008) highlighted, the ability to communicate effectively, collaborate within teams, and apply critical thinking is as important as technical proficiency for securing employment and excelling in QS roles. Therefore, Higher Education Institutions (HEIs) play a critical role in bridging this skills gap by integrating technical and interpersonal skills training into their QS programs (Habizah Sheikh Ilmi et al., 2021). Research indicates that structured training and continuous professional development significantly enhance graduates' job readiness (Dada & Jagboro, 2018). Effective strategies include collaborating with industry practitioners as guest lecturers, updating syllabus to align with current industry needs, and embedding employability skills training within academic courses (Tokijan & Aziz, 2023). Nonetheless, most similar studies are focused on West Malaysia, leaving a significant gap in understanding the specific needs of East Malaysia, particularly Sarawak, where the construction industry is growing. Therefore, the present study aims to address this gap by identifying effective strategies for enhancing QS graduates' employability in Sarawak, thereby improving their career prospects within the region's construction sector.

II. LITERATURE REVIEW

Several studies have identified methods to enhance the employability of QS graduates. From the extensive review of literature, ten key strategies emerge for bridging the gap between academic preparation and industry expectations as shown in Table 2.1. The ten strategies were carefully selected following an in-depth and structured review of existing literature, concentrating on sources published between 2010 to 2024. A thematic analysis approach was used to examine peer-reviewed articles, guidelines from institutions like the Royal Institution of Chartered Surveyors (RICS), and research focused on employability within the Quantity Surveying and construction fields. Priority was given to strategies that appeared consistently across multiple sources, demonstrated empirical support, and aligned with the emerging needs of Construction Revolution 4.0 (CR4.0). Additionally, the selected strategies were evaluated for their practical applicability to the Malaysian construction industry, with particular attention given to the specific workforce challenges faced by Quantity Surveying graduates in Sarawak.

Table 1.0 Strategies to Enhance the Employability Skills of QS Graduates in Construction Industry

No	Strategies	Authors
1	Invite an experienced QS as a guest lecturer	(Tokijan & Aziz, 2023), (Yusop et al., 2018), (Chai, 2017)
2	Revise the course structure to meet the industry's demands	(Tokijan & Aziz, 2023), (Tharim et al., 2022), (Kibwami et al., 2021), (Chai, 2017)
3	Establish assessment activities that are in line with industry's expectations	(Tokijan & Aziz, 2023), (Chai, 2017)
4	Internship placements	(Tokijan & Aziz, 2023), (Kibwami et al., 2021), (Chai, 2017)
5	Encourage equal collaboration between /universities and professional QS in course design	(Tokijan & Aziz, 2023), (Seidu et al., 2022), (Kibwami et al., 2021), (Yusop et al., 2018), (Chai, 2017)
6	Enhancing orientation training	(Tokijan & Aziz, 2023)
7	Embedding employability skills in course	(Tokijan & Aziz, 2023), (Seidu et al., 2022), (Tharim et al., 2022), (Odubiyi et al., 2019), (Chai, 2017)
8	QS graduates conduct additional research to prepare themselves to meet the workplace requirements	(Tokijan & Aziz, 2023), (Tharim et al., 2022), (Chai, 2017)
9	Problem based learning and role play	(Yusop et al., 2018), (Shafie et al., 2014)
10	Increase the use of technology	(Seidu et al., 2022), (Kibwami et al., 2021)

Enhancing the employability of Quantity Surveying (QS) graduates requires a versatile approach involving academia, industry collaboration, practical training, and technological integration. One effective strategy is inviting experienced Quantity Surveyors to serve as guest lecturers. According to the Royal Institution of Chartered Surveyors (RICS) (2018), guest lectures from industry professionals can significantly improve students' readiness for the workforce by exposing them to real-world experiences and industry expectations. Universities should regularly invite experienced Quantity Surveyors to conduct workshops and guest lectures, thereby offering students valuable insights and connections. Moreover, hearing diverse perspectives helps students understand various

aspects of the industry, making them more adaptable to dynamic market conditions. In addition, guest lectures help graduates remain updated on local industry trends and align their skills with current market demands, enhancing their relevance and employability (Tokijan & Aziz, 2023); Yusop et al., 2018); Chai, 2017)

Furthermore, revising course structures to meet industry demands is essential. Many academic programmes emphasize theoretical knowledge, often neglecting the practical skills required for industry readiness. Periodic curriculum reviews are necessary to integrate critical employability skills, including communication and high order thinking abilities. Additionally, students should carefully evaluate course viability before enrolling, as some universities fail to adequately prepare them for industry demands. Structured activities that promote communication skills, problem-solving abilities, and practical knowledge application are necessary to ensure graduates meet employers' expectations. Next, effective assessment activities designed by universities should reflect current industry practices and requirements, including group discussions, role-play presentations, case studies, and interviews, allowing undergraduates to share ideas and identify their strengths and weaknesses (Tokijan & Aziz, 2023; Tharim et al., 2022; Kibwami et al., 2021; Chai, 2017).

Internship placements are another crucial component for improving QS graduates' employability. Internships offer a valuable bridge between academic learning and real-world application, providing students with firsthand experience in professional environments. However, most internships, lasting four to six months, are insufficient for students to gain substantial practical knowledge. Consequently, employers recommend extending industrial training periods to provide more comprehensive exposure to the work environment. Internships provide opportunities for students to enhance their technical and interpersonal skills, preparing them to address real-world challenges more effectively (Tokijan & Aziz, 2023; Kibwami et al., 2021; Chai, 2017).

Next, collaboration between Higher Education Institutions (HEIs) and employers can further enhance the employability of QS graduates. Moreover, fostering partnerships between universities and industry professionals helps ensure that academic programmes reflect the skills and knowledge desired by employers. Involving experienced Quantity Surveyors in course design allows educational institutions to achieve a balance between theoretical knowledge and practical applications, thereby producing graduates who are well-prepared to meet industry expectations (Tokijan & Aziz, 2023; Seidu et al., 2022; Kibwami et al., 2021; Yusop et al., 2018; Chai, 2017).

Additionally, orientation training plays a critical role in helping QS graduates' transition smoothly into the workplace. Orientation programmes familiarize new hires with company policies, procedures, and standards, enabling them to perform their tasks effectively. Proper orientation training helps reduce risk management issues by ensuring that employees understand how to use resources efficiently (Tokijan & Aziz, 2023).

Embedding employability skills within academic programmes is another important strategy for preparing QS graduates for the workforce. The responsibility of HEIs to provide students with professional knowledge, intellectual skills, and general skills like communication and responsible citizenship, hence, it is strongly recommended that academicians explain how learning outcomes relate to employability, helping graduates make meaningful connections between their education and job market readiness (Tokijan & Aziz, 2023; Seidu et al., 2022; Tharim et al., 2022; Odubiyi et al., 2019; Chai, 2017).

Moreover, QS graduates can enhance their employability by conducting additional research and keeping updated with industry trends. This proactive approach helps QS graduates align their theoretical knowledge with practical skills, making them more charismatic to employers. Additionally, innovative teaching strategies like Problem-Based Learning (PBL) and role-playing can promote critical thinking and communication skills among students. Mock meetings and simulations provide valuable experience in handling real-world challenges, thereby enhancing students' readiness for professional roles (Tokijan & Aziz, 2023; Tharim et al., 2022; Yusop et al., 2018; Chai, 2017; Shafie et al., 2014).

The increased use of technology is another critical factor in improving QS graduates' employability. As construction software tools continue to evolve, it is essential to provide comprehensive training on advanced applications such as Building Information Modeling (BIM) and Computer-Aided Design (CAD). Practical training sessions, tutorials, and assignments must be designed to help students adapt to these tools effectively. Case studies and software demonstrations within coursework offer valuable insights into the application of these technologies in real-world projects. For example, CAD proficiency is essential, and construction professionals must prioritize acquiring this skill to ensure the significance of advanced technologies in improving QS practices, particularly in cost management through solutions like building product models (Seidu et al., 2022; Kibwami et al., 2021).

In conclusion, enhancing the employability of QS graduates requires a comprehensive approach involving collaboration between HEIs and industry professionals, continuous curriculum development, practical training, technology integration, and effective orientation programmes. By adopting these strategies, educational institutions can better equip QS graduates with the necessary skills to thrive in a competitive construction industry. Addressing the skills gap in Sarawak's construction sector through targeted strategies will ensure that QS graduates are well-prepared to meet the evolving demands of the industry and achieve career success.

III. RESEARCH METHODOLOGY

This study will adopt qualitative method to achieve the aim and the objectives. This method is deemed suitable given the relatively small population of QS consultancy firms in Sarawak (only around 38 firms) and the need for in-depth understanding of the issue. Moreover, this method enables researchers to gather rich data by examining participants' experiences and perspectives in detail (André et al., 2017). In addition, this method allow insight into how and why certain strategies might be effective by examining the context and reasoning of industry practitioners (Davies and Hughes, 2022). Open-ended inquiry permits observation of how opinions evolve and how people adapt to new ideas in practice (Queirós et al., 2017). This flexibility is valuable for developing new theories or insights about improving employability skills that may not emerge from rigid quantitative surveys.

Proposed Sampling Procedure

The target population for this research is QS professionals working in QS consultant firms in Sarawak. Participants will be selected using a snowball sampling technique. Snowball sampling begins with one or a few initial subjects who meet the criteria and then utilizes those subjects' referrals to determine further participants (Acharya et al., 2013). In this study, an initial interview participant will be chosen from the list of Sarawak-based QS firms registered with the Board of Quantity Surveyors Malaysia (BQSM). After the first interview, subsequent participants will be identified based on recommendations provided by preceding interviewees. This referral-based approach is effective for reaching a niche professional community and helps build trust, as referrals come from known colleagues. The enlistment of new potential participants continued until data saturation was achieved, that is, until additional interviews yielded no substantially new information or themes. Data saturation indicates that a sufficient sample size has been reached for the purposes of the study, and further data collection becomes unnecessary (Aldiabat & Le Navenec, 2018).

Proposed Data Collection

Data will be collected through semi-structured interviews with the selected QS professionals. Semi-structured interviews will be chosen because they offer a balance between structure and flexibility. An interview guide will be prepared with a set of predetermined open-ended questions focusing on employability skills and enhancement strategies. However, interviewers will be having the freedom to ask follow-up questions based on each participant's responses. This arrangement encourages a conversational flow and allows important unexpected topics to emerge (Kallio et al., 2016). Each interview will be conducted in person or via video call, depending on the participant's location and preference. With the interviewee's consent, conversations will be audio-recorded to ensure accuracy of data capture. Participants will also be assured of confidentiality so that they could converse openly about their experiences. Recording and transcribing the interviews verbatim will provide a reliable record for analysis and assist to prevent any important details being lost (Husband, 2020). Throughout the data collection process, ethical guidelines will be followed, and potential participants are permitted to decline answering any question or withdraw at any time.

The interview process includes questions designed to explore strategies to enhance the employability skills of QS graduates. Specifically, interviewees are asked, "What strategies do you think universities should implement to increase the employability skills of future QS graduates? What is the reason for the proposed strategies?" and "How effective are internship programs in preparing QS graduates for real-world work? Why do you think so?" The interview session is expected to involve five participants, each of whom will receive an official consent letter outlining the purpose and scope of the study. The consent letter will be signed by the interviewees, signifying their willingness to participate in the study. This ensures ethical research practices and confirms their agreement to be interviewed.

Proposed Data Analysis

The interview transcripts will be analyzed using qualitative content analysis. Content analysis is a systematic technique for interpreting textual data by coding and identifying recurring themes or patterns (Mayring, 2021). In practice, the researcher first read through all transcripts multiple times to become familiar with the data. Next,

meaningful pieces of text related to employability skills or enhancement strategies will be labeled with codes. These codes will then be examined for similarities and grouped into broader categories reflecting common themes, for example "curriculum-related strategies," "industry exposure," "soft skills development". By organizing the data in this way, the researcher could detect which strategies will be most frequently mentioned or emphasized by participants. This method allowed a large amount of qualitative data to be distilled into a clearer structure of findings. Content analysis is well-suited for exploratory studies like this, as it helps to draw insightful conclusions from interview narratives in an organized manner.

Research Reliability and Validity

To ensure the rigour and credibility of the research, the measures of reliability and validity will be considered. Reliability in qualitative research can be enhanced by maintaining consistency in how data are collected and analyzed. In this study, the same interviewer will conduct all interviews following the guide, and a consistent coding scheme will be applied across all transcripts. Additionally, the concept of internal consistency will be kept in mind ensuring that the findings are coherent and not contradicted by different parts of the data (Clayson, 2020). Where possible, key interpretations will be cross-checked through participant validation to improve reliability. Furthermore, an awareness of inter-rater reliability will be applied during coding, for example, if more than one person coded the data, their agreement on codes would indicate the stability of the analysis (Arenas, 2018). For validity, the study focused on internal validity, making sure the results accurately reflect the phenomena being studied. This can be achieved by carefully aligning the interview questions and procedure with the research objectives, so that data collected directly pertained to the question of enhancing employability skills. By selecting participants who are well-placed to comment on graduate skills (experienced QS consultants) and by thoroughly covering all relevant subtopics in interviews, the study increases confidence that the findings are rooted in genuine industry conditions rather than external factors. In addition, using established concepts and categories from the literature review as a basis for analysis help to ensure that the variables examined are relevant and grounded in existing research (Hassan, 2024).

IV. EXPECTED FINDINGS

The study identifies three key strategies that hold the most potential for enhancing the employability of Quantity Surveying (QS) graduates in Sarawak, based on qualitative insights and literature support. The first strategy emphasizes fostering collaboration between universities and professional Quantity Surveyors to enhance course relevance and quality. By combining academic expertise with practical industry experience, this partnership ensures curricula are balanced with theoretical knowledge and practical skills, making graduates better prepared for the evolving demands of the construction and cost management industries. Such collaboration also helps keep educational programs up to date with current industry standards, ultimately enhancing graduate employability. The second strategy focuses on embedding employability skills directly into QS courses, emphasizing the development of both technical and soft skills like leadership, time management, and digital literacy. Integrating these skills into practical assignments, collaborative projects, and simulated work environments provides students with hands-on experience, boosting their confidence and aligning their training with employer expectations.

The third strategy involves revising course structures to align with industry demands, technological advancements, and emerging market trends. This can be achieved by introducing specialized subjects, offering practical learning opportunities such as internships or case studies, and incorporating relevant tools and techniques into the curriculum. Collaborative efforts with industry experts to co-develop modules and provide guest lectures further enhance the practicality and currency of course content. The overall findings suggest that combining these strategies establishes a synergetic effect that significantly improves graduate readiness. For stakeholders in Sarawak's construction sector, particularly educational institutions and professional bodies, implementing these strategies collectively can produce more competent and job-ready QS graduates who meet the expectations of employers and thrive in the competitive construction industry.

V. CONCLUSION

The construction industry now demands Quantity Surveyors (QS) to possess advanced technical and soft skills beyond traditional cost management. Proficiency in tools like Building Information Modelling (BIM) for accurate cost estimation and project budgeting is essential for efficient project delivery. Simultaneously, soft skills such as communication, teamwork, and problem-solving are critical for managing complex projects and meeting client expectations. As Sarawak's construction sector continues to expand, it is vital that QS graduates are adequately ready to address these evolving challenges. This study highlights the importance of higher education institutions in enhancing QS graduates' employability by aligning curriculum with industry developments, incorporating practical

training, and promoting strong collaborations with industry stakeholders. By adopting these strategies, educational institutions can better equip their students with the necessary skills to succeed in the competitive construction industry.

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