Revitalizing Quantity Surveying Education: Exploring BIM Mastery with Revit Tools among Students

Noor Akmal Adillah Ismail*
noorakmal@uitm.edu.my
Faculty of Built Environment
Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Har Einur Azrin Baharuddin
hareinur@uitm.edu.my
Faculty of Built Environment
Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Hazwani Ramli
hazwaniramli@uitm.edu.my
Faculty of Built Environment
Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Zulkhairy Affandi Mohd Zaki
zulkhairy86@uitm.edu.my
Faculty of Built Environment
Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Abdul 'Izz Mohamad Kamil
abdulizz89@uitm.edu.my
Faculty of Built Environment
Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Corresponding author*

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ABSTRACT

Building Information Modelling (BIM) is acknowledged as an information technology innovation that enables integrated and collaborative work environments in construction projects worldwide. The Architecture, Engineering, and Construction (AEC) sector has widely embraced BIM to improve efficiency and productivity. In Malaysia, however, Quantity Surveying students often have limited early exposure to BIM, creating a gap between industry demand for BIM-proficient professionals and the readiness of graduates. Strengthening BIM education at higher education institutions is therefore essential to align graduate competencies with industry needs. This study aims to assess students' understanding, awareness, and perspectives on BIM competency and their preparedness to utilize BIM software for future employment. The research was conducted among 203 newly enrolled students undertaking the Computer-Aided Design and Drawing course in the Quantity Surveying degree at the Faculty of Built Environment, Universiti Teknologi MARA Shah Alam. Data were collected through a quantitative survey and analyzed using SPSS, including descriptive statistics, mean score analysis, and frequency distribution. Findings revealed that between 60% and 75% of students reported little to no prior knowledge of BIM and Revit, with many being unfamiliar with the concepts or their applications. Despite this limitation, students demonstrated strong motivation and enthusiasm, with mean scores above 3.2 (on a 5-point scale), reflecting their recognition of BIM/Revit's career value. Students also expressed confidence that incorporating BIM and Revit into the syllabus would enhance their learning, improve digital competencies, and strengthen career readiness. Overall, the study highlights that early exposure to BIM is crucial in shaping future-ready Quantity Surveyors and advancing Malaysia's broader BIM adoption agenda. While this study captures pre-exposure perceptions, future studies could investigate students' skills and challenges after hands-on application to deepen understanding of BIM's role in higher education.

Keywords: quantity surveying, Building Information Modelling (BIM), Revit tools, BIM education, QS students

INTRODUCTION

Building Information Modelling (BIM) has become a key driver of digital transformation in the global construction industry. By enabling multi-dimensional visualisation, simulation, and collaborative workflows, BIM improves productivity and reduces inefficiencies in project delivery. Countries such as the United Kingdom, Singapore, and Hong Kong have demonstrated significant benefits from BIM adoption, positioning it as an industry standard for efficiency and innovation (Howard et al., 2017).

In Malaysia, BIM has been prioritised as part of national construction digitalisation efforts. The Construction Industry Transformation Programme (CITP) 2016–2020 first introduced BIM as a strategic modernisation tool to drive productivity and sustainability (CIDB, 2015). This agenda has been reinforced through the Construction 4.0 Strategic Plan (2021–2025), which highlights BIM as a key enabler of automation, digitalisation, and integrated project delivery (CIDB, 2021). More recently, the National Construction Policy 2030 (NCP 2030) has positioned BIM as a catalyst for quality, productivity, and sustainability goals (CIDB, 2023). These strategies were

further strengthened in 2024, when Prime Minister Anwar Ibrahim announced that all public and private development projects must embrace BIM (Bernama, 2024), followed by CIDB's directive making BIM mandatory nationwide from August 2024 (The Sun Daily, 2024).

Despite these policy directions, a shortage of competent professionals continues to hinder BIM adoption. Research has highlighted persistent gaps in skilled practitioners, which limit the effectiveness of BIM implementation (Suwal et al., 2013; Hosseini et al., 2018). The concept of BIM readiness, defined as students' willingness to engage with BIM and their ability to function effectively in BIM-enabled environments (Kugbeadjor et al., 2015), is therefore crucial to evaluating whether future graduates are adequately prepared. Developed countries such as Australia, Canada, and Singapore have embedded BIM into higher education curricula to enhance graduate employability and digital competencies (Aziz et al., 2019).

In Malaysia, higher learning institutions play a central role in preparing the future workforce for this transition. While previous studies have explored professional perceptions of BIM or curriculum initiatives in architecture and engineering (Howard et al., 2017; Jin et al., 2019; Shelbourn et al., 2017), limited attention has been given to disciplines such as Quantity Surveying. This presents a significant gap in understanding how BIM education contributes to preparing Quantity Surveyors for digitalised industry practices.

This study addresses that gap by examining the awareness, understanding, and attitudes of Quantity Surveying students at Universiti Teknologi MARA (UiTM) towards BIM and related tools. It evaluates their readiness and willingness to adopt BIM as part of their academic training and professional preparation. The contribution is twofold: (i) providing empirical evidence of BIM readiness among Quantity Surveying students in Malaysia, and (ii) highlighting how integrating BIM education can strengthen the digital competencies of future construction professionals.

The remainder of this paper is structured as follows: Section 2 reviews related literature on BIM education and readiness; Section 3 describes the methodology employed; Section 4 presents and discusses the findings; and Section 5 concludes with implications for BIM education and industry practice.

LITERATURE REVIEW

Building Information Modelling (BIM) in AEC Education

The integration of Building Information Modeling (BIM) in AEC education has progressively demonstrated its value in enhancing learning outcomes and professional readiness. Early studies, such as Ismail et al. (2019) and Kordi et al. (2020) in Malaysia, highlighted that BIM-intensive training enhances graduates' employability, collaboration, and communication while improving project quality and reducing costs. Subsequent research explored immersive technologies: Ahmed (2020) and Sanchez et al. (2021) found that VR-enabled BIM applications improve students' comprehension of complex building designs, while Alizadehsalehi et al. (2021) showed that combining information modeling with VR enhances learning performance in key competencies.

Advancing pedagogical strategies, studies such as Uzun and Çakır (2022) demonstrated that BIM enhances architectural design processes through improved visualization and collaboration. Borkowski (2023) proposed a structured experiential learning framework for BIM education, emphasizing active, problem-based engagement. More recent investigations in 2024–2025 further illustrate BIM's evolving role in AEC education. Abouelkhier et al. (2024) reported that integrating 4D BIM with VR significantly improves students' understanding of construction sequencing, while Pacheco et al. (2024) found that BIM adoption fosters innovation and efficiency in construction management training. On a global scale, Correa et al. (2025) benchmarked BIM curricula, showing that structured integration enhances learning outcomes and aligns education with industry standards (see Table 1 for a summary of key findings across countries and contexts).

Table 1. BIM application benefits in AEC education

Authors (Years)	Countries	Key Findings
Ismail et al. (2019)	Malaysia	BIM intensive training enhances graduates' employability and career development by promoting collaboration and information sharing in the AEC industry
Kordi et al. (2020)	Malaysia	BIM into civil engineering curricula enhances project quality, reduce costs, and facilitate communication
Ahmed (2020)	United Arab Emirates	VR-enabled BIM enhances students' understanding of building designs
Sanchez et al. (2021)	Mexico	BIM-VR application enhances e-learning engineering education by improving learning efficiency and understanding of complex concepts
Alizadehsalehi et al. (2021)	United States	IM-into-VR improves students' learning performance in key areas, preparing them for future careers in the industry
Uzun & Çakır (2022)	Turkey	Enhances design processes in architectural design
Borkowski (2023)	Poland	Provides a framework for BIM education using experiential learning strategies, emphasizing active, problem-based teaching.
Abouelkhier et al. (2024)	United Arab Emirates	4D BIM + VR integration significantly improved construction sequencing understanding and student engagement

Pacheco et al. (2024)	Peru	BIM adoption in education enhances construction management training, fostering innovation and efficiency
Correa et al. (2025)	Slovenia	Global benchmarking of BIM curricula demonstrates structured integration levels to improve AEC education worldwide

The studies summarized in Table 1 collectively demonstrate that BIM integration in education enhances technical skills, engagement, collaboration, and innovation. Incorporating immersive technologies such as VR and employing experiential, problem-based learning strategies further strengthen these outcomes. Curriculum recommendations include embedding BIM across courses to develop core technical competencies, integrating VR or 4D simulations to improve visualization and construction sequencing understanding, and promoting active learning frameworks to cultivate problem-solving and collaborative skills. Structured implementation of these strategies ensures graduates are proficient in BIM tools and prepared to meet evolving industry demands, effectively bridging the gap between academic training and professional practice.

Revit Software as BIM Education Tool

Revit is a widely used BIM software in AEC education, enabling the creation of detailed 3D models, interdisciplinary collaboration, and efficient project information management. It is preferred for its user-friendly interface, versatility, and ability to support multiple disciplines, including planning, structural engineering, architecture, and construction management.

Studies from 2019–2022 demonstrate Revit's role in improving design efficiency, integrating structural activities, supporting building lifecycle management, and enabling curriculum integration and plugin development (Marizan, 2019; Tsai et al., 2019; Trebuna et al., 2020; Hadi et al., 2021; Habte & Guyo, 2021; Yuvita & Budiwirawan, 2022).

Recent studies (2023–2025) highlight innovative applications of Revit in education. Jang and Lee (2023) integrated AI-based tools with Revit to enhance interactive architectural design. Rostamiasl and Jrade (2024) developed a semi-automated model and custom plug-in in Revit to support early-stage design evaluation and cost analysis. Bigdeli et al. (2025) applied semantic enrichment in high-rise residential BIM models, and Van et al. (2025) integrated Revit with immersive technologies to improve visualization, simulation, and collaboration.

Overall, these studies confirm Revit's significance as a core BIM educational tool, enhancing students' understanding of modeling processes, interdisciplinary collaboration, and alignment with industry practices. The recent 2023–2025 developments demonstrate its growing sophistication and innovative applications, supporting both learning and professional preparation in the AEC sector.

Table 2. Revit software usage as BIM education tools

Authors (Years)	Courses/Subjects	Key Findings
Marizan (2019)	Planning	Revit simplifies the design process and improves efficiency in time, human resources, and subsequent stages, creating a more realistic 3D model of a 2-storey building
Tsai et al. (2019)	Civil & construction engineering	Revit enables integration of structural design activities and cross-discipline collaboration, benefiting modeling, analysis, design, and clash detection
Trebuna et al. (2020)	Building management	Revit extends from concept to construction and throughout the building lifecycle, including integration with complementary tools like Autodesk ReCap
Hadi et al. (2021)	Structural engineering	Revit supports educational purposes in conjunction with structural analysis software, demonstrating integration into structural engineering curricula
Habte & Guyo (2021)	Structural engineering	Revit enables secondary development, allowing the creation of custom plugins and simplified operations, enhancing functionality and adaptability
Yuvita & Budiwirawan (2022)	Planning	Revit facilitates design integration in universities and helps avoid clashes between designs
Jang & Lee (2023)	Architectural Design	Revit facilitates interactive design processes through integration with pre-trained language models, enhancing architectural education
Rostamiasl & Jrade (2024)	Architectural / Housing Design	Revit enables a semi-automated model and tailored plug-in development, supporting BIM-based education, early-stage design evaluation, and cost analysis
Bigdeli et al. (2025)	Fire Safety Engineering	Revit enables semantic enrichment of a BIM model, focusing on automatic annotation of doors in high-rise residential building models

Van et al. (2025)	Construction Management	Revit serves as a core BIM tool integrated with immersive technologies, enhancing visualization, simulation, collaboration, and understanding of BIM processes

In summary, the studies presented in Table 2 highlight the evolving and multifaceted role of Revit in BIM education across various disciplines. From planning and structural engineering to architectural design, building management, and construction management, Revit consistently enables efficient modeling, interdisciplinary collaboration, and enhanced understanding of BIM processes. The recent developments from 2023–2025 underscore its increasing sophistication, demonstrating innovative integrations such as AI-based tools, semantic model enrichment, and immersive technology applications. These findings reinforce Revit's significance as a core educational tool, providing students with practical skills and aligning academic training with current industry practices. This body of literature establishes a foundation for the present study, which aims to further investigate the effectiveness of Revit in supporting BIM-based learning and professional preparation in the AEC sector.

METHODOLOGY

Research Design

This study employed a survey methodology using questionnaires distributed among Semester 3 Quantity Surveying (QS) students enrolled in the course Computer Aided Design and Drawing (BQS516) at the College of Built Environment, Universiti Teknologi MARA (UiTM) Shah Alam. This undergraduate-level course, a non-core subject with 2 credit hours (2 hours of lecture per week), is mandatory for all QS students in Semester 3. The course, replacing the previous Information Technology course (QSM505), incorporated Autodesk Revit software as the educational tool over a 14-week period. The syllabus included a comprehensive introduction to Building Information Modelling (BIM) technology.

For this study, a structured questionnaire was developed to elicit information on students' understanding, awareness, and attitudes towards BIM and Revit software. The questionnaire was designed based on a review of relevant literature on BIM education and Revit usage (e.g., studies summarized in Table 2) and adapted from commonly used frameworks in technology adoption and educational tools. It consisted of 10 items divided into three sections: students' background, understanding and awareness of BIM and Revit tools, and attitudes towards BIM and Revit application.

Participants

In this study, a comprehensive survey was conducted among a specific group of participants, consisting of 203 Quantity Surveying students who were enrolling in the CAD BQS516 course for the first time. These students were selected as respondents to provide insights into their preliminary understanding, awareness, and perspectives regarding BIM and the practical application of Revit software, pivotal aspects of their curriculum. The method of distributing the survey involved an organized process where hardcopy questionnaires were handed out to all

students during their very first class session. This session was not only mandatory but also crucial, as it provided an opportunity for face-to-face engagement, ensuring maximum participation. During this time, students were also given a detailed briefing about the structure of the course, which was aligned with the outlined syllabus, setting a foundational understanding of what the course entails and how it integrates with BIM and Revit software.

Instruments

The survey questionnaire was designed and divided into three sections pertinent to the study's objectives. Section A was dedicated to gathering detailed demographic information about the respondents, including but not limited to their age, gender, and current level of education, aiming to establish a clear profile of each participant. Whilst Section B was specifically crafted to probe into the students' level of understanding and awareness concerning BIM and Revit software. It comprised a set of five formulated questions, each employing a frequency rating scale with options including 'Never', 'Rarely', 'Sometimes', 'Often', and 'Always', designed to gauge the frequency of the students' engagement with or exposure to BIM and Revit concepts prior to the study. Lastly, Section C was structured to explore the students' attitudes towards the application of BIM and Revit software in a more in-depth manner. This was achieved through a series of 10 statements, to which respondents were asked to indicate their level of agreement or disagreement on a 1-5 Likert scale, where '1' represented 'Strongly Disagree', and '5' signified 'Strongly Agree'. The questionnaire was reviewed by two academic experts in BIM education to ensure clarity and relevance, supporting content validity. Although formal reliability testing (e.g., Cronbach's alpha) and factor analysis were not conducted, the expert review provided assurance that the instrument effectively captured the intended constructs. Future research could incorporate these statistical analyses to strengthen the psychometric properties of the questionnaire.

Data Analysis

The survey results underwent thorough descriptive analysis utilizing the Statistical Package for Social Science (SPSS) software, a widely recognized tool for statistical analysis. This comprehensive analysis encompassed various statistical measures, including frequency analysis to determine the occurrence of responses, mean value index calculation to ascertain the central tendency of the data, and skewness measures to assess the distribution's symmetry. Subsequently, the gathered findings were organized into tabulated formats and discussed accordingly, ensuring alignment with the structured sections delineated within the questionnaire. Through this approach, the students' understanding, awareness, and attitudes concerning the adoption of BIM and Revit software were evaluated and deliberated upon. As a conclusion of the study's findings and analyses, insightful recommendations were formulated, aimed at delineating new directions for future research endeavors within this evolving domain of study.

RESULTS AND DISCUSSION

Respondents' Profile

The survey questionnaire was administered to second-year Bachelor of Quantity Surveying students at Universiti Teknologi MARA Shah Alam, with 203 students actively participating.

The predominant age group was between 21 to 23 years old. Female students constituted the majority of respondents, comprising 72.4 percent. A significant portion of the participants (53.2%) had acquired diploma certification prior to embarking on their degree program at Universiti Teknologi MARA Shah Alam. Table 3 presents a detailed summary of the respondents' demographic information.

Table 3. Respondents' profile

		Frequency (No.)	Percentage (%)
Age	18-20 years old	58	28.6
	21-23 years old	142	70.0
	24-26 years old	3	1.5
	Total	203	100.0
Gender	Male	56	27.6
	Female	147	72.4
	Total	203	100.0
Education level	STPM	34	16.7
	Matriculation	56	27.6
	Diploma	108	53.2
	Others	5	2.5
	Total	203	100.0

Understanding and Awareness on BIM and Revit Software

According to the survey findings, a notable 58.6% of the students were unfamiliar with BIM and Autodesk Revit prior to the survey. Only a minimal percentage of students, 3.4% for BIM and 1.5% for Revit, responded with "Always" when asked if they had prior knowledge of BIM and Autodesk Revit. When queried about their awareness of the application of BIM and Autodesk Revit, a substantial portion of the students, 75% for BIM and 73.4% for Revit, indicated that they had no previous knowledge. Conversely, only 1% responded with "Often" and 0.5% with "Always" for BIM, while 6% responded with "Often" and 0.5% with "Always" for Revit.

Concerning the technical understanding of BIM and Revit, a significant majority of students, 78.3% for BIM and 75.9% for Revit, expressed that they had no idea how these technologies work. In contrast, a minimal percentage of students (1%) claimed to have "Often" or "Always" understood both BIM and Revit. Most students lacked awareness regarding the contributions of BIM and Autodesk Revit to construction projects, with 63.1% responding with "Never" for BIM and 68% for Revit. Conversely, only a small majority of students (1.5% for BIM and 2.5% for Revit) indicated "Always" being aware of these contributions.

Furthermore, the majority of students were not familiar with the main benefits of BIM and Autodesk Revit, with 67.5% responding with "Never" for BIM and 72.9% for Revit. Only a minor percentage (3.4% for BIM and 3.0% for Revit) indicated "Often," while 2.5% for BIM and 2.0% for Revit chose "Always" when asked if they were aware of the main benefits. Refer to

Table 4 for a comprehensive representation of students' knowledge and awareness regarding BIM and Revit software.

Table 4. Understanding and Awareness on BIM and Revit Software

Questions		BIM		REVIT	
		Frequency (No.)	Percentage (%)	Frequency (No.)	Percentage (%)
Have you heard of BIM/ Autodesk Revit Architecture before? (Without knowing what it is)	Never	119	58.6	119	58.6
	Rarely	30	14.8	38	18.7
	Sometimes	40	19.7	28	13.8
	Often	7	3.4	15	7.4
	Always	7	3.4	3	1.5
	Total	203	100.0	203	100.0
Do you know the application of BIM/ Autodesk Revit Architecture?	Never	154	75.9	149	73.4
	Rarely	31	15.3	33	16.3
	Sometimes	15	7.4	14	6.9
	Often	2	1.0	6	3.0
	Always	1	0.5	1	0.5
	Total	203	100.0	203	100.0
Do you have any idea how BIM/ Autodesk Revit Architecture works? (In term of technical aspect)	Never	159	78.3	154	75.9
	Rarely	30	14.8	34	16.7
	Sometimes	10	4.9	11	5.4
	Often	2	1.0	2	1.0
	Always	2	1.0	2	1.0
	Total	203	100.0	203	100.0
Are you aware of what BIM/ Autodesk Revit Architecture can bring to construction projects?	Never	128	63.1	138	68.0
	Rarely	35	17.2	30	14.8
	Sometimes	24	11.8	22	10.8
	Often	13	6.4	8	3.9
	Always	3	1.5	5	2.5
	Total	203	100.0	203	100.0
Are you aware of the main benefits of BIM/ Autodesk Revit Architecture?	Never	137	67.5	148	72.9
	Rarely	32	15.8	31	15.3
	Sometimes	22	10.8	14	6.9
	Often	7	3.4	6	3.0
	Always	5	2.5	4	2.0
	Total	203	100.0	203	100.0

Survey results indicate that students had limited prior exposure to BIM and Revit, with on average 58.6% reporting they had never heard of these tools, and 75–78% lacking technical understanding (Table 4). Awareness of their applications and benefits in construction projects was similarly low. The low understanding can be attributed to several factors. Curriculum exposure is minimal, as students primarily relied on 2D CAD tools such as AutoCAD prior to this course, limiting interaction with BIM processes or Revit functionalities (Rosli et al., 2016; Agirbas, 2020). Industry exposure also remains low; although BIM adoption is increasing in Malaysian firms, students rarely encounter BIM applications firsthand (Rosli et al., 2016; Correa et al., 2025). Finally, the technological complexity of BIM and Revit, which integrates design, technical, and project management knowledge, may overwhelm students without prior structured guidance (Bigdeli et al., 2025; Van et al., 2025). These findings underscore the gap between students' prior experience and the skills required for BIM/Revit proficiency, reinforcing the need for structured instructional interventions.

Attitudes towards BIM and Revit Software Application

On average, students expressed enthusiasm about learning more about BIM, with a mean score of 3.28. Following closely, students acknowledged that BIM would enhance their future career development. However, a contrasting viewpoint emerged as students disagreed with the statement "I understood the definition of BIM," reflected by a mean score of 1.62. Similarly, students indicated disagreement with the statement "I understand the key concept and usefulness of BIM for the construction industry," yielding a mean score of 1.58. Agreement was also lacking for the statement "I have read about BIM before taking this course."

Notably, the top two statements exhibited higher standard deviations exceeding 1.00, signifying considerable variability among respondents' answers (1.497 and 1.543), indicative of high variance. Additionally, these statements displayed negative skewness, suggesting that the distribution is concentrated on the left side/negative direction, representing responses ranging from strongly disagree to disagree.

Regarding Revit, a consensus emerged among students who believed that possessing knowledge of Revit would add value to their future career development, as indicated by a mean score of 3.36. Students also expressed readiness to learn and explore Revit, reflected in a mean score of 3.28. Disagreement surfaced in response to the statement "I think I can learn Revit through websites such as YouTube," with a mean score of 2.29. Similarly, students disagreed with the statement "I understand the importance and usefulness of Revit for the Quantity Surveyor job scope," garnering a mean score of 1.91. On average, students indicated a lack of experience with Revit before taking the course, with a mean score of 1.35.

Consistent with the BIM-related questions, the top two statements for Revit demonstrated negative skewness, suggesting a concentration of responses on the left side. Examining the tabulated data reveals that from the first rank to the fourth rank, all statements exhibit a standard deviation exceeding 1, indicating high dispersal among responses. Refer to Table 5 for a detailed presentation of the results concerning students' perceptions of BIM and Revit software application.

Table 5. Attitudes towards BIM and Revit Software Application

	Statements	Min.	Max.	Mean	SD	Var	Skewness	
Perception on BIM	I am excited to know more about BIM	1.00	5.00	3.28	1.497	2.240	-.419	.171
	I know BIM will give me added value to my future career development	1.00	5.00	3.20	1.543	2.380	-.302	.171
	I understood the definition of BIM	1.00	4.00	1.62	0.844	0.713	1.126	.171
	I understand the key concept and usefulness of BIM for construction industry	1.00	4.00	1.58	0.813	0.661	1.090	.171
	I have read about BIM, before I am taking this course	1.00	5.00	1.57	0.872	0.761	1.586	.171
Perception on Revit Software	I know Revit will give me added value to my future career development	1.00	5.00	3.36	1.474	2.173	-.452	.171
	I am ready to learn and explore Revit	1.00	5.00	3.28	1.477	2.183	-.420	.171
	I think I can learn Revit through website i.e. YouTube Manual etc.	1.00	5.00	2.29	1.138	1.296	.243	.171
	I understand the importance and usefulness of Revit for QS job scope	1.00	5.00	1.91	1.140	1.299	.945	.171
	I have experience with Revit before I am taking this course	1.00	4.00	1.36	0.663	0.439	1.920	.171

Concerning the students' perspectives on BIM and Revit software application, it can be deduced that, despite their initial lack of knowledge and awareness, there is a notable interest among students in gaining a deeper understanding of BIM technology and the tools associated with Revit. This aligns with findings presented by Rosli et al. (2016), which reported positive feedback from students regarding the potential utility of Revit – BIM software in future applications, even in the absence of specific training or courses on the software. Given the increasing global utilization of BIM technology, Agirbas (2020) underscored that students who acquire awareness of the BIM environment during their undergraduate studies may potentially transition more swiftly into the professional realm than their counterparts who lack such exposure. The positive attitude towards learning BIM and Revit suggests that, with targeted instruction, students can quickly acquire essential skills, supporting both academic success and future employability. These insights reinforce the importance of incorporating Revit-focused modules in the Quantity Surveying curriculum to bridge the knowledge gap and foster

competency in BIM-based project delivery (Rosli et al., 2016; Agirbas, 2020; Bigdeli et al., 2025).

Overall, the findings are significant to the study because they identify key gaps in knowledge, awareness, and technical understanding among Quantity Surveying students prior to the course. This baseline information provides empirical evidence for educators and curriculum developers, confirming the need for a systematic, Revit-focused BIM instruction program. By revealing both students' initial unfamiliarity and their positive attitudes toward learning, the study demonstrates that integrating Revit into the curriculum is not only relevant but essential for preparing students to meet industry expectations and enhance professional competence in BIM-related tasks. Consequently, these findings validate the study's objectives and provide a solid foundation for recommending pedagogical strategies that enhance BIM and Revit adoption in higher education.

CONCLUSION AND RECOMMENDATION

The evaluation of students' knowledge, awareness, and perceptions of BIM and Revit software reveals two contrasting yet complementary insights. On one hand, students demonstrated limited prior knowledge of BIM and Revit, as many had not encountered these terms before and were unable to explain their functions or benefits. On the other hand, they expressed a strong willingness to learn, showing enthusiasm toward the integration of these tools into their academic journey.

Importantly, students expressed confidence that incorporating BIM technology, along with Revit, into the course syllabus would enrich their learning. This reflects their awareness of the growing importance of digital skills in the construction sector and their belief that early exposure to BIM will enhance their career readiness. Such positive attitudes, despite limited baseline knowledge, highlight a strong foundation for developing future-ready professionals.

The study acknowledges certain limitations, particularly its focus on students prior to exposure to BIM and Revit. As such, findings are based on perceptions and intentions rather than direct experience. Future research could expand this scope by examining students' skills and understanding after hands-on engagement with BIM applications, while also exploring specific challenges in learning and applying Revit.

Overall, the findings demonstrate the significance of early-stage readiness in shaping Malaysia's broader BIM adoption objectives. Cultivating positive attitudes and building foundational knowledge among students not only supports individual learning outcomes but also contributes to the wider construction industry's transition toward digitalization and more efficient practices.

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Conflict of Interest

The authors have no conflicts of interest to declare.

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Authors' Contributions

The authors confirm contribution to the paper as follows: study conception and design: first and second authors; data collection: fifth author; analysis and interpretation of results: third and fourth authors; draft manuscript preparation: all authors. All authors reviewed the results and approved the final version of the manuscript.