INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 14, Issue 4, (2025) E-ISSN: 2226-6348

Predictors of Commitment to Teach BIM among Vocational College Teachers in Southern Region of Malaysia

Hazel Michelle Anak Aeng, Nur Hazirah Noh@Seth

Faculty of Educational Sciences and Technology, Universiti Teknologi Malaysia

Email: sueetsu13@gmail.com, nurhazirah.n@utm.my

DOI Link: http://dx.doi.org/10.6007/IJARPED/v14-i4/27049

Published Online: 19 November 2025

Abstract

Malaysia's construction industry is adopting Building Information Modelling (BIM) in line with the Construction 4.0 transformation. BIM integration in vocational colleges curriculum aim to prepare graduates with the digital construction skills. Successful implementation depends on the readiness of teachers which limited by gaps in training, confidence and institutional support. This research investigates the level of preparedness, self-efficacy, institutional support and commitment to teach BIM. A quantitative cross-sectional survey involving 92 teachers from 12 vocational colleges in the southern region was conducted. Data were collected using a set of 5-point Likert scale questionnaire validated by experts. The findings indicate that most teachers feel prepared, supported by their institutions and committed to teach BIM. Self-efficacy, particularly in handling technical aspects of BIM, was only moderate and many teachers reported not receiving formal training. Spearman's rank-order correlation revealed significant positive relationships between commitment and preparedness (r_s = 0.766, $p < .01$), self-efficacy (r_s = 0.499, $p < .01$) and institutional support (r_s = 0.632, $p < .01$). The research concludes that continuous professional development, improved resources and stronger institutional recognition are needed to strengthen BIM teaching. Addressing these areas is critical to ensure consistent, confident BIM instruction that supports Malaysia's Construction 4.0 ambitions.

Keywords: Building Information Modelling, Vocational Education, Self-Efficacy, Institutional Support, Commitment

Introduction

In recent years, Building Information Modelling (BIM), has emerged as a significant innovation in the global construction industry. BIM refers to the use of digital tools and processes to design, manage and execute construction projects in a way that allows for better communication, decision-making and collaboration throughout the project's lifecycle (Waqar et al., 2023). Many countries have begun to require or strongly encourage the use of BIM for public and private projects and Malaysia is no exception. With the launch of the Malaysian BIM Roadmap and the Construction Industry Transformation Programme (CITP), the nation

has shown its commitment in digitalising the construction sector and preparing the workforce for the era of Construction 4.0.

Vocational colleges play a crucial role in achieving this goal. These vocational colleges provide technical and practical training for young Malaysians, ensuring that graduates possess not only traditional skills but also the digital literacy demanded by modern construction employers. In line with this agenda, BIM has been made a compulsory subject in the Diploma in Construction Technology programme offered by vocational colleges. However, while this policy is ambitious, it also introduces several challenges for both teachers and institutions. Many institutions still struggle with outdated facilities, slow curriculum updates and the lack of ongoing training and support for (Ismail et al., 2025; Mohamad et al., 2022).

The success of BIM education depends largely on the preparedness and confidence of, the level of support provided by their institutions and the degree of their commitment to teach the subject. Previous research has found that many vocational feels unprepared to teach digital subjects like BIM, partly due to insufficient exposure, limited professional development and inadequate support from their colleges (Arif et al., 2021; Rahim et al., 2023). The unique context of vocational colleges, which often operate with fewer resources and stricter management structures compared to universities, makes it even more important to understand the factors influencing teachers' commitment to teach BIM.

This research seeks to address these issues by investigating the levels of preparedness, self-efficacy, institutional support and commitment among construction technology teachers in the southern region of Malaysia. By identifying the factors that affect the ability and willingness of teachers to teach BIM, this research aims to provide recommendations that can strengthen BIM education in vocational colleges and help the country move forward in its Construction 4.0 journey.

Methodology

This research adopted a quantitative, cross-sectional survey design to explore the factors influencing the readiness of construction technology teachers to teach Building Information Modelling (BIM) in Malaysian vocational colleges. The research focused on teachers from the Diploma in Construction Technology programme across 12 vocational colleges located in the southern region of Malaysia. The sample consisted of 92 teachers who were selected using a simple random sampling method. This approach ensured that every eligible instructor in the population had an equal chance of being chosen, thus improving the representativeness of the sample and minimising selection bias (Kumar, 2011; Cohen et al., 2017).

The primary research instrument was a structured questionnaire, carefully developed based on Bandura's Social Cognitive Theory (1986) and Meyer and Allen's Organisational Commitment Theory (1991). The questionnaire comprised five sections, namely demographic details, preparedness for BIM teaching, self-efficacy, institutional support and commitment to teach BIM. Each section used a five-point Likert scale, allowing respondents to express varying levels of agreement or disagreement with the statements provided. This scaling helped capture more nuanced data and better reflect the attitudes and experiences of the teachers.

Before the main data collection, the questionnaire was reviewed by a panel of experts in vocational education and BIM, ensuring content validity and relevance to the local context. A pilot study was also conducted where the instrument demonstrated excellent reliability, with an overall Cronbach's alpha of 0.95. Data were analysed using SPSS Version 25, employing both descriptive statistics to summarise the profiles and main variables, as well as inferential statistics, such as Spearman's rank-order correlation, to examine the relationships among preparedness, self-efficacy, institutional support and commitment. Throughout the research, ethical guidelines were strictly followed, including obtaining informed consent and protecting participant confidentiality (Cohen et al., 2017; Kumar, 2011).

Results and Discussion

The survey involved 92 construction technology teachers from 12 vocational colleges int the southern region of Malaysia. The majority of respondents were female and most held at least a Bachelor's degree in a construction-related field. The teaching experience among the respondents was diverse, with a significant proportion having more than 10 years of service in vocational education. However, it is important to note that only about 17 percent of teachers reported having attended any formal BIM training, which reveals a significant professional development gap within the teaching force. To aid interpretation of the research findings, the levels for each main variable were determined based on the median score range. The median scores for preparedness, self-efficacy, institutional support and commitment were categorised as low, moderate, or high according to the range specified in Table 1.

Table 1
Interpretation of Level Based on Median Score Range

Median Score Range	Level
1.00 - 2.33	Low
2.34 - 3.67	Moderate
3.68 - 5.00	High

Preparedness

The findings on preparedness show that most teachers generally felt prepared to deliver BIM lessons to their students. Many agreed that they could design lesson plans incorporating BIM concepts and update their teaching materials to reflect current industry standards. teachers also reported confidence in managing student projects related to BIM and in integrating BIM topics with other construction technology subjects. However, a deeper look at the data showed that this preparedness often stemmed from general teaching experience rather than actual BIM training. When asked about formal exposure or structured training in BIM, a considerable number of teachers chose neutral or negative responses, indicating that their preparedness may not be backed by technical expertise (Ismail et al., 2024).

One major finding is that teachers' sense of preparedness often comes from their overall teaching experience rather than direct training or hands-on experience in BIM. This observation is in line with research by Zhang and Sihes (2024), who reported that TVET tend to rely on self-learning, informal sharing among colleagues or previous exposure to digital tools instead of taking part in structured professional development activities. While informal learning can help teachers adapt to new topics, it is not always enough to keep up with the fast-changing technology in construction. As BIM software and standards continue to

advance, the lack of regular and targeted upskilling leaves and their students at risk of falling behind (Ismail & Mustafa Kamal, 2022; Mohamad et al., 2022; Zhang & Sihes, 2024).

Self-Efficacy

Self-efficacy, which refers to the teachers' belief in their own ability to teach BIM effectively, was found to be moderate overall. While respondents showed reasonable confidence in delivering theoretical aspects and managing classroom activities, many admitted to being less certain about handling technical BIM software, troubleshooting, or supporting students with advanced BIM tasks. This was especially evident among senior teachers who have taught for many years but may lack digital technology exposure. The lack of ongoing professional development opportunities for BIM contributes to these moderate self-efficacy levels (Zafar & Khushi, 2022).

The moderate level of self-efficacy among teachers, especially with technical aspects of BIM, is another concern. Many teachers in this research said that they felt less confident troubleshooting BIM software, designing lessons for students with different levels of digital literacy, or guiding students through advanced BIM projects. This finding is supported by the results of this research, where many respondents selected "Neutral" or "Disagree" for items related to technical problem-solving and customising BIM lessons, indicating uncertainty in these areas. This challenge is also described by Zafar and Khushi (2022), who found that vocational often hesitate to adopt new digital technologies when they lack institutional support. In Malaysia, there are still not enough BIM workshops, industry placements or regular mentoring sessions for (Joseph Thomas et al., 2023; Mohd Hatta Md Hani et al., 2024). This situation is especially challenging for senior, who are experienced in traditional construction but less exposed to new digital approaches (Salleh et al., 2022; Ramli et al., 2022).

Institutional Support

Analysis of institutional support revealed that most teachers felt generally supported by their colleges when it came to basic resources and encouragement to teach BIM. Many reported that they could access at least minimal software and that collaborative discussions were encouraged. Nevertheless, responses became more neutral when asked about specific support for BIM professional development, technical troubleshooting, or access to industry-standard software. This points to an urgent need for colleges to strengthen targeted support for BIM, moving beyond basic resource provision to more focused, hands-on support (Mohamad et al., 2022).

Institutional support remains an essential factor for successful BIM education. While most colleges provide basic resources and encourage teamwork, the findings show that teachers need more specific support for BIM teaching. This includes having access to updated BIM software, relevant teaching materials and regular professional development focused on BIM. Mohamad et al. (2022) emphasised that continuous and BIM-focused training is crucial for to feel fully supported. Without these opportunities, teachers may not be able to keep their skills current and may feel stressed or unappreciated, especially if their extra efforts are not recognised by college leaders. The results of this research revealed that although many agreed their colleges provided opportunities for collaboration and some BIM resources, gaps remained in terms of adequate technical support, BIM-specific training and access to up-to-

date software (Ismail et al., 2025; Kapuza et al., 2022; Rasmet et al., 2025). These limitations, as highlighted in the research, are often linked to resource constraints, rigid governance and slow curriculum updates, which make it challenging for teachers to fully implement and sustain BIM education. The lack of structured professional development and limited industry collaboration further reduce the level of support available to (Suryandoko, 2023; Ramli et al., 2022).

Commitment

Commitment to teach BIM was rated highly among the teachers. Many expressed a strong sense of professional and ethical responsibility to ensure students are prepared for future industry needs. The affective and normative commitment scores were particularly high, showing that most teachers feel passionate and obligated to teach BIM well. However, some respondents indicated that their efforts are not always formally recognised or incentivised by their colleges, which may affect their long-term motivation (Estrada & Mamani, 2020; Bading, 2023).

Recognition and rewards for teachers who show excellence and innovation in BIM teaching are also important. According to Estrada and Mamani (2020), when receive meaningful incentives such as awards, public recognition, or opportunities for promotion, their commitment and motivation tend to increase. In this research, a number of teachers felt that their dedication to BIM was not always matched by appropriate recognition or support from the institution. This mismatch may affect morale and motivation over time, as indicated by findings where several respondents reported neutral or lower levels of continuance commitment. The research suggests that without visible benefits or rewards, teachers may feel that their efforts are undervalued, which can impact their willingness to remain committed over the long term (Bading, 2023; Estrada & Mamani, 2020). Previous studies have also shown that teachers' motivation is strengthened when institutions provide clear career pathways, concrete rewards and public recognition for excellence in teaching new technologies like BIM (Prempeh & Kim, 2022; Touni, 2023).

Table 2
Descriptive Statistics for Main Research Variables

Variable	Median	IQR	Level
Preparedness to teach BIM	4.0	1.0	High
Self-efficacy to teach BIM	3.0	2.0	Moderate
Institutional support to teach BIM	4.0	1.0	High
Commitment to teach BIM	4.0	1.0	High

Correlation Analysis

Statistical analysis using Spearman's rank-order correlation demonstrated that all three independent variables, namely preparedness, self-efficacy and institutional support, were positively and significantly related to commitment. The strongest correlation was observed between preparedness and commitment ($r_s = 0.766$, $p < 0.01$). Institutional support also showed a strong positive relationship with commitment ($r_s = 0.632$, $p < 0.01$), while self-efficacy, though slightly weaker, was still significantly correlated ($r_s = 0.499$, $p < 0.01$). These findings suggest that as teachers feel more ready, supported and confident, their commitment to teach BIM also increases.

Table 3
Spearman's Correlation between Main Variables and Commitment to Teach BIM

Variables	Spearman's (r_s)	Strength
Preparedness - Commitment	0.766	Very Strong
Self-efficacy - Commitment	0.499	Strong
Institutional support - Commitment	0.632	Strong

The positive correlations between preparedness, self-efficacy, institutional support and commitment highlight the need for a comprehensive approach. Improving one area alone will not lead to real progress. This research found that preparedness had a very strong positive relationship with instructor commitment, while self-efficacy and institutional support showed strong relationships with commitment as well (Mohamad et al., 2022; Kölemen, 2023). These findings are consistent with Bandura's Social Cognitive Theory, which emphasises that confidence and readiness can significantly enhance motivation and engagement in professional roles (Bandura, 1986). Vocational colleges and policymakers need to invest in professional development, provide strong technical and resource support and create systems for recognising teachers' contributions to BIM education. Collaboration with industry partners should also be encouraged, so teachers can gain practical BIM experience through real construction projects. Such a comprehensive strategy is needed to develop both the practical skills and the supportive environment required to sustain high levels of instructor commitment in BIM teaching.

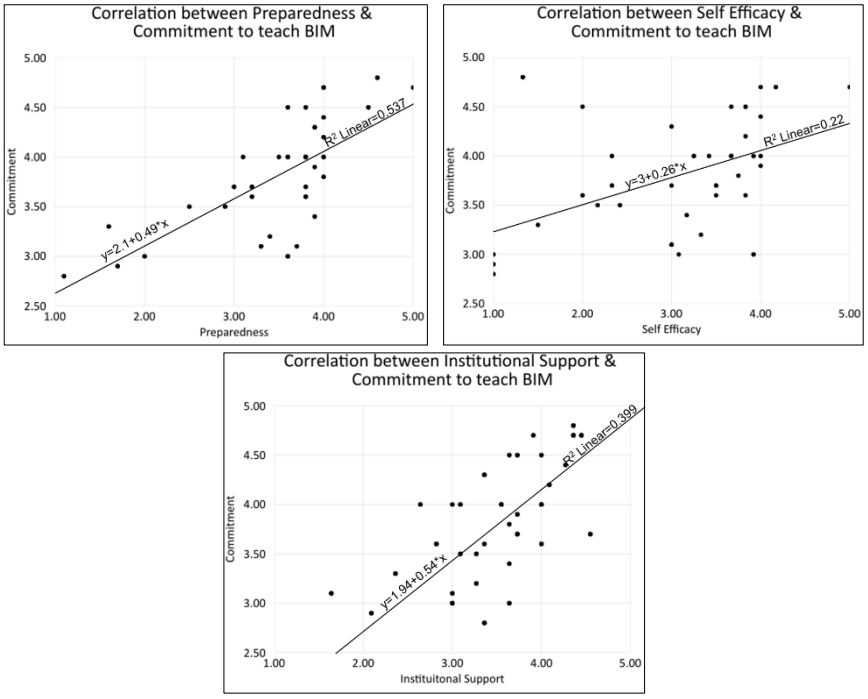

Figure 1 Scatter plots showing correlations between preparedness, self-efficacy, institutional support and commitment to teach BIM

Figure 1 illustrates the scatter plots showing the correlations between each of the three independent variables and the teachers' commitment to teach BIM. The strongest positive linear trend was observed between preparedness and commitment ($R^2 = 0.537$), followed by institutional support ($R^2 = 0.399$), while self-efficacy showed a weaker but still positive trend ($R^2 = 0.220$). These graphs support the findings of the Spearman's correlation, which indicate

that as teachers feel more prepared and institutionally supported, their commitment to deliver BIM content increases significantly. Even in cases where technical self-efficacy was moderate, a positive relationship with commitment was still evident.

Overall, the data show that preparedness, self-efficacy and institutional support are all essential in supporting instructor commitment. The findings highlight the urgent need for continuous professional development, more BIM-specific resources and institutional recognition to help teachers feel confident and effective in BIM teaching. These results can help vocational college leaders and policymakers make more informed decisions to strengthen BIM education and meet Malaysia's Construction 4.0 goals.

Conclusion

This research provides a detailed picture of the factors influencing the readiness of construction technology teachers to teach BIM in Malaysian vocational colleges. The findings suggest that making BIM compulsory in vocational education is a timely and positive move, especially as Malaysia works towards the goals of Construction 4.0. However, the research also highlights that there are still significant gaps between the policy and the actual practice in vocational colleges.

While it is encouraging that most teachers show high levels of commitment and a genuine willingness to teach BIM, there remain clear weaknesses in technical self-efficacy. Many teachers have confidence in their general teaching abilities but feel less prepared to handle the technical requirements and software-related challenges that come with BIM. The lack of formal BIM training opportunities and limited exposure to current industry practices are major reasons why self-efficacy is only moderate among many respondents. Without addressing these gaps, there is a risk that teachers may struggle to deliver BIM content at the standard expected by employers and the industry.

Institutional support was also found to be a crucial factor. Teachers who feel supported by their colleges, have access to up-to-date software and are given opportunities for continuous professional development are more likely to remain motivated and effective in their teaching roles. This research finds that while general support exists, more targeted resources and structured training are still needed. Furthermore, colleges must do more to recognise and reward teachers who show innovation and dedication in BIM teaching. Recognition and incentives not only boost morale but also encourage teachers to invest extra effort and stay committed to improving their practice.

The research also confirms that preparedness, self-efficacy and institutional support are all closely linked to instructor commitment. Improving these areas will not only benefit teachers but will also have a direct impact on the quality of BIM education received by students. This is vital if Malaysia wants to produce graduates who are truly equipped with the digital skills demanded by the modern construction industry.

In conclusion, the journey towards making Construction 4.0 a reality in Malaysia depends on the strength of its TVET system and the people who deliver its curriculum. Policymakers, college leaders and other stakeholders should work together to provide continuous hands-on professional development, ensure access to the latest resources and build a culture of

recognition for teachers. By doing so, vocational colleges can become leaders in digital construction education and help Malaysia achieve its vision for a skilled and competitive workforce. This research offers practical recommendations that can guide efforts to close the gap between policy and practice and to ensure that TVET graduates are well prepared for the challenges and opportunities of the future.

Overall, this research's implications are highly relevant for the future of TVET in Malaysia. By implementing these recommendations, vocational colleges can become strong contributors to national goals for Construction 4.0 and ensure that graduates have the digital competencies required for the evolving construction industry.

Acknowledgement

The author wishes to sincerely thank all construction technology teachers from vocational colleges in the southern region of Malaysia who participated in this research. The support from the panel of experts who validated the research instrument, as well as the guidance provided by academic supervisors, is gratefully acknowledged. Special thanks are also extended to the Ministry of Education Malaysia and the Technical and Vocational Education and Training Division for granting permission to conduct this research. Without their cooperation and encouragement, this research would not have been possible.

References

Arif, N. K., Hasmori, M. F., Deraman, R., Yasin, M. N., & Mohd Yassin, M. A. (2021). Readiness of Malaysian Small and Medium Enterprises Construction Companies for Building Information Modelling Implementation. *IOP Conference Series: Materials Science and Engineering, 1200*(1), 012027. https://doi.org/10.1088/1757-899x/1200/1/012027

Bading, W. C. (2022). Organizational Commitment of Teachers: Its effects on the performance of students in the high Schools of Sanchez Mira, Cagayan. In *AIDE Interdisciplinary Research Journal,* 92–94. https://orcid.org/0000-0003-0601-6217

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Cohen, L., Manion, L., & Morrison, K. (2017). Research Methods in Education (8th ed.). Routledge.

Estrada, E., & Mamani, H. (2020). Compromiso organizacional y desempeño docente en las Instituciones de Educación Básica. *Revista Innova Educación, 2*(1), 132–146. https://doi.org/10.35622/j.rie.2020.01.008

Ismail, N. A., & Kamal, E. M. (2022). The awareness of implementing BIM among educators in Malaysian TVET institutions. *Journal of Technical Education and Training, 14*(1), 73-88. https://doi.org/10.30880/jtet.2022.14.01.007

Ismail, N. N. H., Kamal, N. E. M., & Fizal, N. M. F. M. (2024). A Systematic Literature Review: Implementing Building Information Modelling (BIM) for TVET Educators in Malaysia. *Journal of Advanced Research in Applied Sciences and Engineering Technology, 49*(1), 194–210. https://doi.org/10.37934/araset.49.1.194210

Joseph Thomas, J. Soosiamaal, Jamaluddin, R., & Abdullah, A. (2023). The use of digital learning: A predictive model of knowledge, readiness and attitude factors among technical and vocational education (TVET) teachers in secondary schools. *ANP Journal of Social Sciences and Humanities, 4*(2), 32-41. https://doi.org/10.53797/anp.jssh.v4i2.5.2023

Kapuza, A., Kolygina, D., Khavenson, T., & Koroleva, D. (2022). A time to gather stones–barriers to use technologies before the COVID-19 school closures. *International Journal of Educational Management, 36*(6), 923-936. https://doi.org/10.1108/IJEM-04-2021-0135

Kölemen, C. Ş. (2023). Self-Efficacy Perception of Education faculty members on technology integration. *International e-Journal of Educational Studies, 7*(14), 393–406. https://doi.org/10.31458/iejes.1258553

Kumar, R. (2011). Research Methodology: A Step-by-Step Guide for Beginners (3rd ed.). SAGE Publications.

Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review, 1*(1), 61–89. https://doi.org/10.1016/1053-4822(91)90011-Z

Mohamad, A. H. F., Ismail, S., Fathi, M. S., & Mohd Zaki, N. I. (2022). Building Information Modelling Industry Centre of Excellence (BIM ICoE) for Kolej Kemahiran Tinggi MARA (KKTM), Majlis Amanah Rakyat (MARA). *Civil Engineering and Architecture, 10*(4), 1547–1555. https://doi.org/10.13189/cea.2022.100424

Mohd Hatta Md Hani, A. Ismail, S. S. Razali, M. N. Abu Bakar, N. L. Rosman, N. Nasir, & Z. Mohamad (2024). The development of digital competence model among TVET educators towards digitization: A concept paper. *Journal of TVET and Technology Review, 2*(1), 1-18. https://doi.org/10.30880/jttr.2024.02.01.001

Prempeh, P., & Kim, J. (2022). The impact of leadership style on teachers' organizational commitment. *International Journal Of Social Science And Education Research Studies, 2*(08). https://doi.org/10.55677/ijssers/v02i08y2022-02

Rahim, N. S. A., Ismail, S., Subramaniam, C., Habib, S. N. H. A., & Durdyev, S. (2023). Building information modelling strategies in sustainable housing construction projects in Malaysia. *Sustainability, 15*(3), 2313. https://doi.org/10.3390/su15032313

Ramli, A. I., Soffi, M., & Noh, M. (2022). The Level of Knowledge and Skill of UTHM Engineering Lecturers on Building Information Modeling (BIM). *Recent Trends in Civil Engineering and Built Environment, 3*(1), 1958–1969. https://doi.org/10.30880/rtcebe.2022.03.01.217

Rasmet, R. R., Shaafi, N. F., & Mohd Hisham, M. H. (2025). Factors affecting the teaching of Building Information Modeling (BIM) course among Civil Technology lecturers at Kolej Vokasional in the Sabah zone. *Journal of Creative Practices in Language Learning and Teaching, 13*(1), 133-145. 10.24191/cplt.v13i1.4233

Salleh, M. H., Abdul Kadir, S., Jamaluddin, R., & Mohd Puad, M. H. (2022). Factors influencing TVET teacher's TPACK competencies. *Journal of Technical Education and Training, 14*(3), 105-111. https://doi.org/10.30880/jtet.2022.14.03.010

Suryandoko, W. (2023). Bandura's Social Cognitive Theory and Its Implementation in Markeso Mudo's Garingan Ludrukan Monologue. *Gondang: Jurnal Seni dan Budaya*. https://doi.org/10.24114/gondang.v7i1.48188.

Touni, M. I. (2023). The relationship between career development and organizational commitment among faculty of nursing teaching staff. *Journal of Social Sciences*, 29(4), 88–99.

Waqar, A., Othman, I., Hayat, S., Radu, D., Khan, M. B., Galatanu, T. F., Almujibah, H. R., Hadzima-Nyarko, M., & Benjeddou, O. (2023). Building Information Modeling—Empowering Construction Projects with End-to-End Life Cycle Management. *Buildings, 13*(8). https://doi.org/10.3390/buildings13082041

Zafar, M., & Khushi, Q. (2022). Exploring Social and Cognitive skills of Students in Online Classes: A Case Study under Bandura's Theory. *Global Language Review*. https://doi.org/10.31703/glr.2022(vii-ii).31.

Zhang, Z., & Sihes, A. J. B. (2024). Overcoming low teaching self-efficacy of English as a foreign language teachers in secondary vocational schools. *Journal of Curriculum and Teaching, 13*(1), 36. https://doi.org/10.5430/jct.v13n1p36