Student Engagement, Learning Environment, Motivation and Technology Integration towards Teacher Teaching Skills in Suburban Secondary School at Melaka, Malaysia: Proposed Framework

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Abstract
This study proposes a conceptual framework examining the relationships between student engagement, student motivation, student learning effectiveness, and technology access towards teaching skills in suburban secondary schools. Based on a review of relevant literature, the framework suggests student-related factors and technology access play a significant role in shaping teachers' teaching skills. This proposed framework aims to provide a theoretical foundation for future empirical studies and to support the improvement of teaching practices in suburban secondary schools. The proposed framework suggests higher levels of student engagement, motivation, and learning effectiveness, supported by adequate technology access, contribute positively to the development and enhancement of teaching skills among secondary school teachers. The findings of this study are expected to serve as a theoretical foundation for future empirical research and to guide educators and policymakers in improving teaching practices through targeted interventions and effective technology integration.
Keywords: Teaching Skills, Student Engagement, Student Motivation, Student Learning Effectiveness, Technology Access, Suburban Secondary Schools

Introduction
Education system has increasingly emphasised the importance of developing strong teaching skills to support effective teaching and learning in secondary schools (Gouseti et al. 2024). Rapid advancements in technology, coupled with evolving pedagogical approaches, have transformed classroom practices and raised expectations for teachers to integrate digital tools meaningfully into instruction (Hassan, 2023). Teaching skills have become a critical component in ensuring learning objectives are achieved and students remain actively engaged in the learning process (Vaghela and Parsana, 2024).

Despite ongoing efforts to enhance teaching quality, disparities in technology access and learning environments continue to pose challenges, particularly in suburban secondary schools (Lawrence et al. 2021). Teachers often face constraints related to limited technological resources, inconsistent internet connectivity, and varying levels of student readiness (Kormos, 2024). These challenges may affect teachers' ability to apply innovative teaching strategies, sustain student engagement, and effectively support students' learning needs (Barbosa and Coneway, 2023).

Previous studies have highlighted the influence of student engagement, student motivation, and student learning effectiveness on teaching practices. Engaged and motivated students are more likely to participate actively in classroom activities, which in turn supports teachers in implementing effective instructional strategies (Munna and Kalam, 2021). Similarly, students' learning effectiveness reflects the extent to which teaching approaches successfully facilitate understanding and knowledge retention (Gasparic et al. 2024). However, the extent to which these student-related factors, alongside technology access, contribute to the development of teaching skills in suburban secondary schools remains underexplored.

Therefore, this study seeks to propose a conceptual framework examines the relationships between student engagement, student motivation, student learning effectiveness, and technology access towards teaching skills in suburban secondary schools. By presenting a structured framework grounded in existing literature, this study aims to contribute to the understanding of factors influencing teaching skills and to provide a foundation for future empirical research in suburban educational settings.

Problem Statement

Effectiveness of teaching skills is widely recognised as a key determinant of successful teaching and learning in secondary education. Teachers are expected to demonstrate strong instructional, classroom management, and technology integration skills to support diverse student needs (Abedi, 2024). However, differences in school contexts, particularly in suburban secondary schools, present challenges may hinder the development and application of effective teaching skills.

Suburban secondary schools often experience uneven access to technological resources, including limited digital devices, inadequate internet connectivity, and insufficient technical support (Kazmi, 2023). These constraints can restrict teachers' ability to integrate technology into teaching practices, thereby affecting instructional delivery and classroom engagement (Akram et al. 2022). While technology integration has been shown to enhance teaching practices, limited access may reduce its potential impact on improving teaching skills (Yilmaz, 2021).

Low levels of engagement and motivation may limit teachers' opportunities to apply interactive and student-centred teaching strategies, while reduced learning effectiveness may indicate mismatches between instructional approaches and student needs (Han, 2021). Although these factors have been examined individually in previous studies, their combined influence on teaching skills in suburban secondary schools has received limited attention.

Therefore, there is a need for a structured framework explains how student engagement, student motivation, student learning effectiveness, and technology integration collectively influence teaching skills in suburban secondary schools. Addressing this gap is essential to provide clearer insights into factors affecting teaching skills and to guide future empirical research aimed at enhancing teaching practices in suburban educational contexts.

Research Framework
The theoretical framework illustrated in Figure 1 was developed based on the literature reviewed and evaluated to determine teaching skills towards student engagement, student motivation, student learning effectiveness, and technology integration in suburban secondary schools. This study variables consist of independent and dependent variables, whereby teaching skills represent the dependent variable, while student engagement, student motivation, student learning environment, and technology integration are the independent variables. Figure 1 presents the hypotheses developed for this study, which are formulated based on the research questions and research objectives.
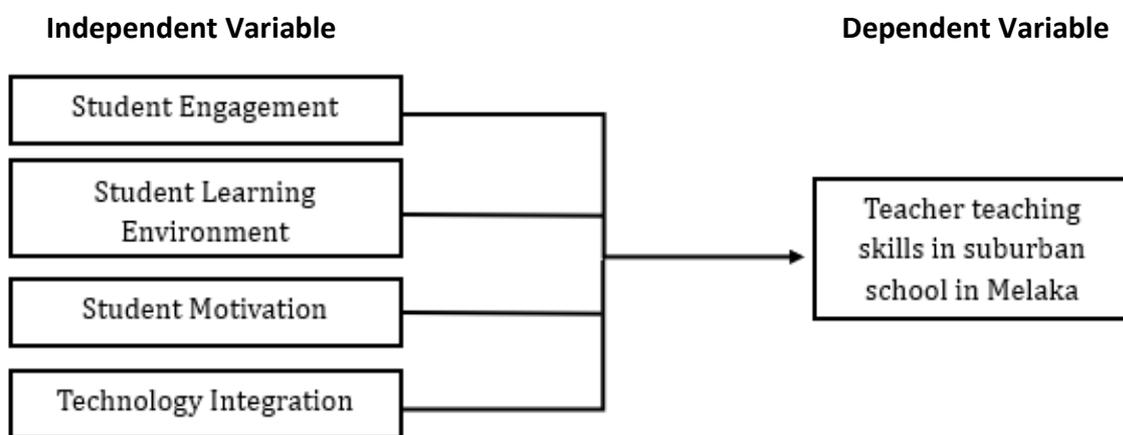

Figure 1: Proposed Theoretical Framework

Hypothesis Development
Based on the research objectives and conceptual relationship between the variables, the following hypotheses are examined and tested in this study

Relationship between Student Engagement and Teaching Skills
Student engagement is widely acknowledged as a critical component of effective classroom teaching (Wong and Liem, 2022). Engaged students actively participate in learning activities, demonstrate attentiveness, and respond positively to instructional strategies (Ginting, 2021). Such engagement creates a dynamic classroom environment allows teachers to implement varied teaching approaches, including interactive discussions, collaborative learning, and inquiry-based activities (Saheli, 2025). These practices require teachers to apply a range of teaching skills, thereby contributing to their professional development.

Student engagement also provides teachers with immediate and continuous feedback regarding the effectiveness of their teaching strategies (Heilporn et al. 2021). When students are attentive and involved, teachers can better assess students' understanding and adjust instructional methods accordingly (Afzal and Rafiq, 2022). This ongoing interaction supports

reflective teaching practices, enabling teachers to refine lesson delivery, classroom management, and assessment techniques, all of which are essential components of teaching skills.

Levels of student engagement may be influenced by factors such as learning resources, classroom conditions, and students' exposure to technology-enhanced learning (Njeri and Taym, 2024). Teachers who experience higher student engagement are more likely to experiment with student-centred instructional strategies, which further strengthen their teaching skills (Fufa et al. 2023). Conversely, low engagement may restrict teachers' ability to practise and enhance interactive teaching approaches.
Therefore, this study proposes the following hypothesis:
H1: There is a positive relationship between student engagement and teaching skills in suburban secondary schools.

Relationship between Student Motivation and Teaching Skills
Student motivation is a fundamental factor influences learning behaviour and classroom interaction (Naz et al. 2022). Motivated students tend to show enthusiasm, persistence, and a willingness to engage in learning tasks, which supports a positive instructional environment (Cayubit, 2022). Such an environment enables teachers to apply teaching strategies more effectively and to focus on improving instructional quality rather than managing disengaged behaviour.

Motivation among students also influences teachers' instructional decisions and teaching approaches (Nahid et al. 2023). When students demonstrate high motivation, teachers are encouraged to adopt diverse teaching strategies, provide meaningful feedback, and design learning activities challenge students' abilities (Radil et al. 2023). These instructional practices require teachers to continuously develop their teaching skills in areas such as lesson planning, instructional delivery, and student assessment.

Variations in student motivation in suburban secondary school may arise due to differences in socio-economic background, access to learning support, and exposure to engaging teaching methods (Tan, 2024). Teachers who work with motivated students may experience more productive classroom interactions, which support the development and refinement of teaching skills (Susanti et al. 2025). Low student motivation may limit instructional effectiveness and reduce opportunities for teachers to practise advanced teaching strategies. Thus, the following hypothesis is proposed:
H2: There is a positive relationship between student motivation and teaching skills in suburban secondary schools.

Relationship between Student Learning Environment and Teaching Skills
Student learning environment plays an important role in shaping the effectiveness of teaching practices (Khan et al. 2024). A supportive learning environment, which includes classroom conditions, availability of learning resources, and positive teacher–student interactions, creates opportunities for teachers to implement instructional strategies more effectively (Odiljonova, 2024). Such environments allow teachers to focus on lesson delivery and instructional quality, thereby supporting the development of teaching skills (Meng, 2023).

A positive learning environment also influences classroom behaviour and student participation, which directly affects teachers' instructional practices (Li and Xue, 2023). When the learning environment is conducive, teachers are more likely to apply student-centred teaching approaches, manage classrooms effectively, and engage students in meaningful learning activities (Mohammad, 2022). These practices require the application of diverse teaching skills, including classroom management, communication, and instructional planning.

Variations in the learning environment may arise due to differences in infrastructure, class size, and access to teaching materials (Abizada and Seyidova, 2024). Teachers operating in supportive learning environments may have greater opportunities to refine their teaching skills through reflective practice and instructional adaptation (Sharma, 2024). Conversely, less supportive environments may pose challenges limit teachers' ability to enhance their teaching skills.

Accordingly, this study proposes the following hypothesis:

H3**:** There is a positive relationship between the student learning environment and teaching skills in suburban secondary schools.

Relationship between Technology Integration and Teaching Skills
Technology access has become an increasingly important factor in shaping contemporary teaching practices (Angwaomaodoko, 2023). Access to digital devices, internet connectivity, and educational technologies enables teachers to integrate multimedia resources, online learning platforms, and digital assessment tools into classroom instruction (Adeshina, 2024). Integration supports the development of teaching skills by allowing teachers to diversify instructional strategies and enhance student engagement.

Technology access also influences teachers' confidence and competence in using digital tools for teaching (Mayantao and Tantiado, 2024). When adequate technological resources are available, teachers are more likely to explore innovative instructional methods, such as blended learning and technology-supported collaboration (Dahri et al. 2024). Teachers require to develop advanced teaching skills related to instructional design, digital content delivery, and classroom facilitation (Ajani, 2024).

Technology access may be uneven, affecting teachers' ability to integrate technology consistently into teaching practices (Afzal et al. 2023). Limited access may restrict instructional flexibility and reduce opportunities for teachers to enhance their teaching skills through technology use (Safidon, 2024). Conversely, sufficient technology access can support the continuous development of teaching skills by enabling teachers to adopt modern instructional approaches aligned with current educational demands.

Therefore, this study proposes the following hypothesis:

H4: There is a positive relationship between technology integration and teaching skills in suburban secondary schools.

Conclusion
This study proposes a conceptual framework examines the relationships between student engagement, student motivation, student learning effectiveness, and technology access towards teaching skills in suburban secondary schools. The framework was developed based on an extensive review of relevant literature and aims to provide a structured understanding

of key factors may influence teachers' teaching skills within contemporary educational settings.

The proposed framework highlights the importance of both student-related factors and contextual support in shaping teaching skills. Student engagement, motivation, and learning effectiveness are identified as essential elements influence classroom interaction and instructional practices, while technology access serves as a supporting factor enables teachers to enhance their instructional approaches. By integrating these variables into a single framework, this study addresses gaps in existing literature, particularly in relation to suburban secondary school contexts.

This conceptual framework contributes to educational research by offering a theoretical foundation for future empirical studies investigating teaching skills. It is expected the framework will assist researchers, educators, and policymakers in understanding the factors influencing teaching skills and in designing strategies to improve teaching practices through targeted interventions and effective technology integration. Future studies are encouraged to empirically test the proposed framework to validate the relationships and further enhance its applicability across different educational contexts.

Declaration
We declare this manuscript is our original work and has not been submitted or published in any other journal. All authors have contributed significantly to the conception and completion of this study. Any remaining errors or oversights are entirely our own and occurred beyond our knowledge or observation.

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