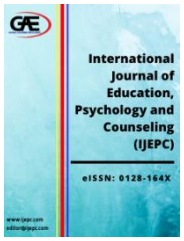
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BRIDGING THE GAP IN COLLABORATIVE TEACHING: WHAT MAKES STUDENTS ACCEPT AND SUCCEED?

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Abstract:

Collaborative teaching is proposed as an important teaching approach to facilitate the development of 21st-century higher-order thinking skills in the fast-changing higher education environment. Although many studies have been conducted on the efficacy of collaborative teaching, its technological benefits, or students' acceptance, no model integrating all these aspects has been proposed so far. This article is based on the theories of Social Cognitive and Social Constructivism and unites scattered parts of the literature into a unified conceptual framework to study the factors affecting students' acceptance and success. In this study, we systematically review literature and analyze key dimensions in both face-to-face and digital settings. The synthesis suggests that instructional design alone is not enough to guarantee student acceptance. Rather, such acceptance is largely dependent on psychological factors such as learner self-efficacy and emotional engagement. Furthermore, these collective models are not effective without institutional preparation and cultural context, which influence pedagogical change. The main finding of this study is the formulation of the "Collaborative Teaching Acceptance Model," a novel conceptual framework that extends existing literature and offers educators and institutional leaders a guide for future empirical testing and institutional diagnosis. This article concludes by emphasizing the necessity for university leaders to strengthen teacher coordination, develop students'

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self-efficacy, provide appropriate digital infrastructure, and cultivate supportive institutional cultures to bridge the divide between technology and human factors.

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Keyword:

Collaborative Teaching, Conceptual Model, Educational Psychology, Learning Outcomes, Student Acceptance

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Introduction

In this era of globalization, collaborative teaching has emerged as a revolutionary pedagogy, accepted and adopted globally. It is increasingly used to improve students' learning outcomes by leveraging the knowledge and learning experiences of several educators while also deepening their learning experience (Mahat et al., 2024). In collaborative learning approaches, students are encouraged to learn actively through student-centered learning, which involves critical thinking and self-regulation to master difficult concepts (Awang-Hashim et al., 2023; Herrera-Pavo, 2021). In response to the needs of 21st-century learning (Su et al., 2024), higher education institutions worldwide have widely adopted collaborative teaching to improve educational quality and foster shared academic responsibility among students. Although the global community recognizes the significance of collaborative education, challenges often arise during its implementation.

The Malaysian higher education scene is a good example of this global revolution in pedagogy. National education frameworks are designed to promote student-centred learning and the holistic development of graduates. Collaborative learning is gaining importance in higher education in Malaysia to develop higher-order thinking and integrative learning skills, in line with the country's vision to produce competitive, flexible knowledge workers (Awang-Hashim et al., 2023). Malaysian educators are persuaded to realize these policy aspirations in practice through various means, from professional development sessions to sophisticated technological integrations. For example, team teaching and collaborative professional development have been found to improve critical thinking, offer learners various perspectives, and prompt feedback (Gono & de Moraes, 2023; Strand et al., 2026). Also, modern collaborative classrooms are increasingly equipped with technology such as human-machine collaborative teaching (HMCT) with AI tools (Mi et al., 2024), specifically designed collaborative learning spaces (Lu et al., 2017), and computational techniques such as Genetic Algorithms to optimize

student group dynamics (Khoual et al., 2026). The innovative approaches are important for optimal student engagement in interactive paradigms such as role playing and peer feedback (Marquez et al., 2023; Zitha et al., 2023) and are based on models such as the Taxonomy of Collaborative E-learning (Salmons, 2008) with improved techniques of knowledge management (Caballé et al., 2010).

Although the instruments and theory of collaborative teaching are sound, a significant gap remains between their actual classroom implementation and the proposed theory. However, in many classrooms, educators may face challenges related to scheduling, preparation time, and maintaining student engagement; in online learning, they may face additional challenges in this regard (Cortes & Mistades, 2021). At a deeper level, institutional isolation and structural obstacles may hinder collaborative instruction, such as cross-departmental collaboration and the co-creation of curriculum, which further affects the progress of collaborative teaching (Musendekwa, 2025; Smith et al., 2020). While many of the above issues have been addressed by scholars and practitioners in previous research, there is a significant gap in the literature regarding the audience for this pedagogy: the students. To close this gap, a paradigm shift is needed to better understand the psychological, social, and technological factors that affect student acceptance and, in turn, their final learning outcomes.

Students' emotional engagement, sense of community, and campus connectedness are important drivers of students' academic persistence and have a significant bearing on the success of collaborative teaching (Laux et al., 2016). Teaching teams need to provide a sense of psychological safety so that students feel comfortable taking intellectual risks, support them in embracing and thriving in collaborative contexts (Hackett et al., 2021), and ensure that digital tools are perceived as useful and easy to use (Chan & Ng, 2024; Su et al., 2024). Moreover, individual preparation, including constructing concept maps alongside strong educator modelling and scaffolding, greatly enhances the quality of joint products. (Bopardikar et al., 2011) Besides, psychological factors such as students' attitudes and intrinsic motivation are vital in facilitating the adoption of such collaborative approaches, which, in turn, can enable them to be actively involved in the physical and virtual learning ecosystems (Zaky, 2026). Theoretical frameworks for the measurement of engagement (Abedin & Daneshgar, 2007) provide a platform for understanding these processes, but the practical implementation of such models is somewhat disjointed.

Many factors have been identified in previous research as relevant to a collaborative approach to education, including technology, group dynamics, and emotional engagement. However, there is an urgent need to develop holistic conceptual models that integrate these multidimensional factors in explaining student acceptance and learning performance, particularly in the Malaysian context. This study, therefore, tries to fill this important gap by developing and validating a conceptual model of collaborative education involving these technological, social, and psychological dimensions. Through this process, we will be able to collect detailed data on the factors that affect students' comfort and success in collaborative learning environments and thus provide empirically based recommendations for educators and policymakers to improve collaborative teaching in Malaysia and beyond.

Prior studies have investigated the effectiveness of collaborative teaching, the technological capabilities, and the students' attitudes individually, but there is a big gap in integrated models that integrate these components. Particularly, the existing literature does not specify the

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interaction of technological and co-teaching inputs with students' psychological mechanisms for acceptance and learning.

Underpinning Theories Overview

A theoretical approach is required that integrates various dimensions of psychological agency and social-interpersonal factors to understand collaborative teaching and its effects on learner acceptance and learning. The finding is supported by the merger of the Social Cognitive Theory (SCT) and Social Constructivism. Social Cognitive Theory provides a strong theoretical basis for exploring the motivational drivers and self-regulatory processes underlying students' acceptance of novel pedagogical transformations (Zhang et al., 2021; Ye et al., 2025). Meanwhile, Social Constructivism is the epistemological basis for viewing collaborative education as a social process that enables the co-construction of knowledge and the development of higher-order cognitive functions (Awang-Hashim et al., 2023). These ideas combine acceptance as a behavioral goal and learning outcomes as cognitive and social achievements. The basic logic linking these theories works in a sequential way: systemic instructional and technological inputs create a supportive classroom climate that develops learner self-efficacy and emotional engagement (under Social Cognitive Theory), which in turn allows students to enter Vygotsky's Zone of Proximal Development and reach higher-order cognitive outcomes, such as critical thinking and academic persistence (under Social Constructivism).

Within the framework of triadic reciprocal determinism, a process in which personal, contextual, and behavioral factors interact, the Social Cognitive Theory conceptualizes students' acceptance. Self-efficacy and outcome expectations primarily influence students' acceptance. Students are more likely to intend to engage in collaborative spaces when they perceive they can work in such spaces and that collaborating will result in academic success (Schunk & DiBenedetto, 2020; Zhang, 2023). Also, "perceived fairness" and social relationships in the classroom, as environmental factors, are important antecedents of acceptance, revealing that student motivation is not an individual characteristic but a response to the collaborative climate's supportive or restrictive quality (Anwar et al., 2021).

From this behavioral basis, SCT emphasizes the importance of observed learning and modelling in co-teaching settings. Students witness their teacher working with others, acknowledging changes in teaching, and demonstrating psychological safety and willingness to take risks (Hackett et al., 2021). This social modelling reduces the perceived threat of collaboration, thereby increasing learners' ownership and engagement. As stated in the theoretical process here, student acceptance is a fluid state mediated by the educator's ability to create a community characterized by campus connectivity and interpersonal trust (Su et al., 2024). Social Constructivism theories underlying the shift from acceptance to quantified learning outcomes imply that critical thinking and problem-solving are fundamentally social behaviors. This highlights the Zone of Proximal Development (ZPD) and the need for pedagogical scaffolding from the collaborative teaching team. In this notion, teachers move away from being the sole source of knowledge toward being facilitators of structured inquiry and modelling so that students are presented with complex problems they could not solve on their own (Abbas et al., 2025; Herrera-Pavo, 2021). "Conceptual Problem-Based Learning" enables the students to externalize their thinking through peer engagement, leading to significant increases in reflective thinking and self-regulation (Muhali & Asy'ari, 2026). Also, the combined effects of classroom and peer-to-peer feedback are emphasized in Social

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Constructivism as learning outcomes, such as integrative thinking and higher-order analysis. In collaborative teaching, when group dynamics are organized (i.e., individual preparation followed by peer concept mapping), the joint product is of higher quality than the sum of the individual contributions (Bopardikar et al., 2011). This socially mediated learning process ensures that student engagement is not merely performative but highly cognitive, as the collaborative environment compels students to negotiate meaning, assess perspectives, and synthesize ideas (Khusna et al., 2024).

The theoretical conversation between SCT and Social Constructivism addresses the "willingness" to learn (acceptance) and the "process" of learning (collaboration). This conversation implies that, for collaborative teaching to be effective, educators must address the psychological barriers described by SCT, such as low self-efficacy or technophobia, to harness the constructivist benefits of social learning (Chan & Ng, 2024). Thus, the conceptual model proposed in this research views student acceptance as a prerequisite mediator that enables students to engage in the high-stakes cognitive effort of collaborative inquiry and problem-solving (Awang-Hashim et al., 2023; Su et al., 2024).

However, these theories are valid only under certain boundary conditions and assumptions. It is expected that students have a baseline level of social literacy and that the institutional environment provides the necessary administrative support, including sufficient time for scheduling and collaboration for instructors (Lam & Lau, 2023). Moreover, the use of this theory needs to be contextualized, and cultural differences should be considered. It can be expected that this shift towards collaborative and student-centered approaches is not occurring in all cultures characterized by traditional hierarchical didacticism and that it may be experienced in varying ways. By understanding these constraints, the model will be sensitive to the contextual characteristics of higher education worldwide.

The next phases will build the conceptual model on this double theoretical foundation. It provides a framework to guide the assimilation of many empirical results into a coherent logic. The four key thematic pillars of the theory are self-efficacy, psychological safety, scaffolding, and social mediation. This model suggests that there is a close relationship between student acceptance and student learning outcomes, which are intertwined in a feedback loop: positive collaborative experiences increase students' effectiveness (SCT); students' effectiveness increases the quality of the social interaction and cognitive development (Social Constructivism). This theoretical framework will be used to interpret how individual instructional interventions, ranging from the use of technological tools to team-teaching arrangements, combine to create the modern collaborative classroom for the remainder of this article.

Formulating Independent and Dependent Variables

The framework's main independent variables (IVs) are categorized as Collaborative Teaching Quality and Technological Affordances. Collaborative Teaching Quality can be defined by instructional collaboration and student-educator interaction features that stimulate pedagogical innovation (Awang-Hashim et al., 2023). Another important factor for the model to work is psychological safety within the teaching cohort, which enables educators to engage in risk-taking and collaborative exploration (Hackett et al., 2021).

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The second set of independent variables is technological affordances, or the perceived usefulness and ease of use of collaborative e-learning tools. These technological antecedents enable the collaborative process in digital or blended environments by providing a basis for interactive learning (Chan & Ng, 2024; Salmons, 2008). The systemic inputs for initiating the collaborative learning process are the interplay between these two groups of variables.

The model identifies two key dependent variables, Student Acceptance and Improved Learning Outcomes. Student Acceptance can be measured by students' willingness to participate in collaborative activities and their satisfaction with the team-teaching instructional method (Anwar et al., 2021; Su et al., 2024). Such behavioral acceptability is crucial because it determines the effort and perseverance students put into the collaborative framework.

The second main objective, Enhanced Learning Outcomes, is multidimensional and includes cognitive and metacognitive achievements. Specifically, it includes the development of Critical Thinking Skills, reflective learning, and academic persistence (Laux et al., 2016; Khusna et al., 2024). The model considers them as DVs and provides a clear indication of success in pedagogical terms, relating instructional changes to students' intellectual growth and problem-solving skills (Muhali & Asy'ari, 2026).

The relationship between collaborative antecedents and student results is indirect, mediated by a mechanism pathway of Emotional Engagement and Learner Self-Efficacy. Emotional involvement is the psychological bridge, and positive interactions with many of the faculty members that foster community and campus connectedness increase the student's tendency to adopt the model (Su et al., 2024; Zaky, 2026).

Individual preparation and educator modeling also serve as cognitive mediators of self-efficacy. Students build confidence in their collaborative abilities when they see the excellence of collaboration and participate in organized inquiry (Zimmerman, 2000; Sadoughi & Hejazi, 2023). This improved efficacy is a catalytic mechanism that converts initial acceptance into higher-order critical thinking and self-regulation, leading to successful learning outcomes (Bopardikar et al., 2011; Abbas et al., 2025).

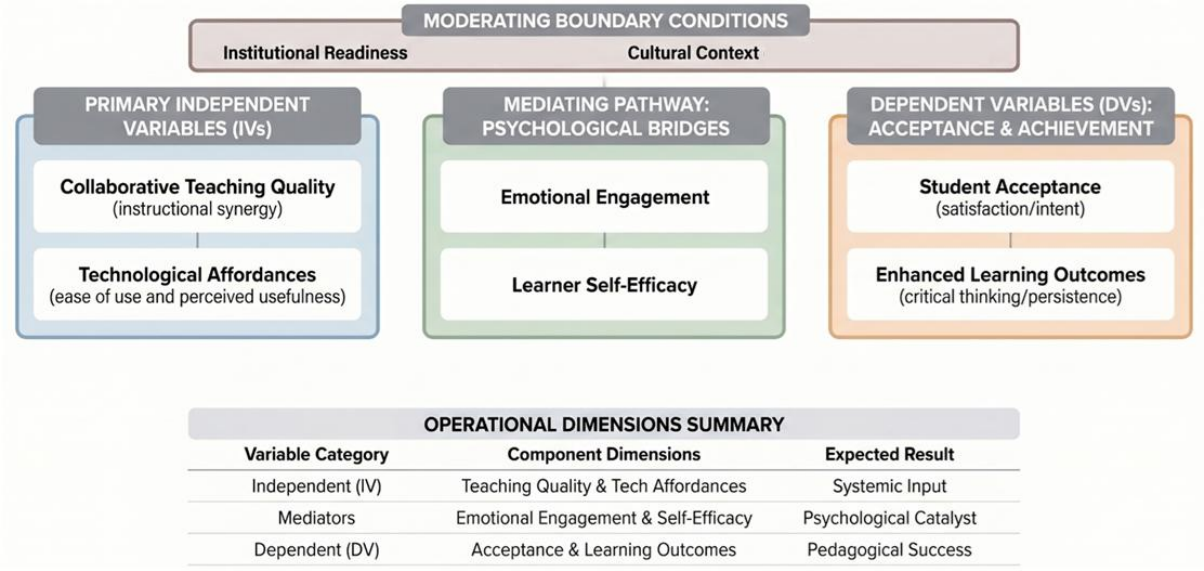
The boundary constraints that moderate this model's robustness are Institutional Readiness and Cultural Context. Whether collaborative teaching can be effectively implemented or remains a theoretical ideal depends on administrative and structural factors, such as the availability of collaborative planning time and supportive scheduling (Lam & Lau, 2023). High-quality instructional efforts may still fall short of their potential without these structural supports. The educator/student role is also essential to the paradigm's success and cultural importance. In cultures where the traditional didactic paradigm is prevalent, students may be more reluctant to collaborate in the early phase (Alkhannani, 2021). Thus, adoption of the model is contingent on how well collaborative learning fits within the organization's educational culture.

The specification of variables offers three proposals for a hierarchical mapping of the conceptual architecture. Proposition 1 (Collaborative Teaching Quality and Technological Affordances positively influence Student Acceptance.) High-quality collaborative teaching and seamless technological integration are important predictors of student acceptance. As such, Proposition 2: The relationship between instructional/technological inputs and student acceptance is facilitated through student emotional engagement and learner self-efficacy,

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highlighting psychological mechanisms as essential catalysts of pedagogical transformation (Pekrun, 2006; Olivier et al., 2019).

Lastly, Proposition 3 (Student Acceptance directly leads to Enhanced Learning Outcomes—critical thinking and persistence) states that better learning outcomes (better critical thinking) require that students accept. The mapping is used in the following synthesis, in the following logical order: antecedents (teaching quality), followed by mediators (engagement/efficacy), and then by the primary outcome (acceptance). Finally, the distal outcome is critical thinking, which occurs within the boundary conditions of institutional and cultural support. The model's interpretation is based on propositional logic, which provides a clear and testable theoretical framework.



OPERATIONAL DIMENSIONS SUMMARY

Variable Category	Component Dimensions	Expected Result
Independent (IV)	Teaching Quality & Tech Affordances	Systemic Input
Mediators	Emotional Engagement & Self-Efficacy	Psychological Catalyst
Dependent (DV)	Acceptance & Learning Outcomes	Pedagogical Success

Figure 1: Conceptual Framework of Collaborative Teaching Acceptance and Achievement

Figure 1 shows the framework that outlines the causal model linking instructional inputs and pedagogical outcomes. In this framework, the shift from collaborative instructional practices to transformative learning outcomes does not occur in isolation. However, it is conditioned by Institutional Readiness and Cultural Context, which serve as moderating boundary conditions. The proposed model, called the Collaborative Teaching Acceptance Model (CTAM), extends classic frameworks, such as the Technology Acceptance Model (TAM), by shifting the focus from purely technical utility to an integrated socio-emotional ecosystem. Unlike standard co-teaching models that focus primarily on instructor-to-instructor dynamics, CTAM explicitly incorporates emotional engagement and self-efficacy as psychological bridges and defines multi-tier outcomes that encompass both student satisfaction and higher-order learning success.

Conclusion

The main aim of this article was to braid the different strands of educational research into a coherent model of collaborative teaching, with reference to the effects of different models on student acceptability and long-term learning outcomes. The work was more than a description of team teaching; it also explored important themes about how the socio-emotional aspects of

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the modern classroom are interwoven with team teaching and technological integration. The purpose of the study was to relate the institutional pedagogical transformation to learners' individual psychological experiences, thereby providing a comprehensive picture of the factors that support the success of collaborative initiatives in higher education.

The proposed conceptual model combines the collaborative ecosystem with the assumption that an educational reform process is multi-layered. Seamless technological affordances and pedagogical dynamics are regarded as important inputs of the systems, and the psychological factors (emotional involvement and self-efficacy) are considered moderators of these systemic factors. The model presented provides a comprehensive view of the link between classroom interactions and learner happiness and cognitive performance under the conditions imposed by institutional preparedness and background. The collaborative education approach proposes that educational change is both structural and socioemotional and that substantial scaffolding is necessary to reach its potential.

This study develops the Collaborative Teaching Acceptance Model, a conceptual framework that provides educators and institutional leaders with a diagnostic guide for future empirical testing and institutional development. It serves as an analytical framework that helps identify potential relationships between teaching quality and higher-order learning outcomes. It follows an argumentative approach, and it is considered comprehensive. Longitudinal research into the effects of collaborative educational approaches on students' career growth and lifelong learning attitudes is challenging. The review focuses on the impact of the implemented approach on students' acceptance of learning and academic success in the short term. The results, however, are unambiguous, and assumptions must be tested across countries and confirmed. The answers to these problems will be crucial for the model's future development and its adaptability to new educational settings.

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