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Article Review

A Pedagogical Perspective on the Reiteration of Blended Learning: A Review Paper vis-a-vis Pre-Post Pandemic

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Abstract

The COVID-19 pandemic has changed the paradigm of traditional education to alternative learning modalities. One of these changes was the use of blended learning in the educational system. Blended learning is a pedagogical approach that combines face-to-face instruction with online learning as a viable solution to address the challenges introduced by the pandemic. The approach began to gain popularity in the Philippines during the post-pandemic period. The use of ICT to facilitate distance learning was emphasized during the lockdown period. As COVID-19 cases declined and classes started re-opening, adherence to health protocols, such as social distancing, was implemented. In this regard, limitations in the class population and outside exposure were addressed by the blended learning approach. Hence, this review article reiterates the pedagogical perspective of blended learning in the educational system during the global and local health crises. This paper reviews the nature of blended learning in the educational system by examining the various theories and models used, more specifically focusing on the advantages and disadvantages of blended learning in basic education. The reiteration of blended learning during the pandemic and related studies are also some focal points of this review article. In brief, blended learning refines the traditional modalities used in the educational system into something suitable for post-pandemic. It integrates the use of digital materials to create a more effective and engaging mode of delivery for learning. With these insights, the development of blended learning is inevitable in the education sector.

Keywords: *Blended learning; COVID-19; Pedagogy; Post-pandemic*

INTRODUCTION

The COVID-19 pandemic has had a global impact on education, requiring every institution to rely on online instruction. As the world resolved this dilemma, schools in the Philippines were compelled to use emergency remote education (Banihashem et al., 2023; Estrellado, 2021). The massive and abrupt change necessitated exploration into ways to improve the quality of instruction and learning during the pandemic. Such an example is the use of ICT-based methods, which has resulted in a shift from conventional classrooms into online learning scenarios. With this paradigm-shifting action in the educational sequence, educators and learners must also acquire digital competencies. This transition indicates the continuous implementation of this instructional method even after the pandemic (Cobo-Rendón et al., 2022).

In the Philippines, the government has declared the reopening of classes as the trend of COVID-19 cases has declined; nonetheless, the customs of the online environment during the pandemic are considered an opportunity to adapt the manner of instruction distinct from the pre-pandemic

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setting (Banihashem et al., 2023). Blended learning has emerged as a modern educational paradigm designed to accommodate student-centered learning during the changing technological landscape. Institutions have recognized the importance of requiring students to finish online courses to complete their academic degrees (Al-Fodeh et al., 2021). As described, the notion has gained traction as the result of the growing popularity of online learning and flipped teaching, prompting educational agencies such as DepEd to implement computerization initiatives in public schools, particularly during the COVID-19 pandemic. This educational evolution has resulted in the development of various theories, such as the situational leadership theory, to optimize learning outcomes in technologically integrated educational settings, ranging from combining face-to-face and online learning to hybrid learning, highlighting tailored instruction, and controlling the momentum, location, and time of learners. Furthermore, numerous research studies have shown that blended learning improves students' academic performance, motivation, and holistic experiences during their learning (Guillen, 2022; Tupas & Linas-Laguda, 2020; Hipol et al., 2020). Students who participated in blended learning demonstrated increased critical thinking, information acquisition, and motivation (Kumar et al., 2021; Bouilheres et al., 2020; Poon, 2013).

Despite the push toward blended learning in the transformative educational system in the Philippines, there remains a large gap in terms of the effectiveness of the new method employed to learners. As stated by Alvarez (2020), that the blended learning in the Philippines is still naive and young, which requires the continuity of validation of the effectiveness and efficiency of this new approach in basic education up to higher education. Hence, this review will help to elaborate "what" and "how" effective blended learning during the post-pandemic era.

This review seeks to provide a clearer basis and perspective on blended learning and reiterates how this strategy has significantly aided in the development of students' creative capacities as well as their capacity to construct knowledge and practical skills across a variety of disciplines.

LITERATURE REVIEW

The Nature of Blended Learning

A decade ago, the use of blended learning was a way to promote innovation, reduce educational costs (Caird & Roy, 2019; Lakhal & Meyer, 2020), create personalized learning experiences (Alamri et al., 2021; Yang & Ogata, 2023; Béres et al., 2012), increase student achievement (Owston et al., 2013), and develop a more student-centered learning approach (Beaver et al., 2014). This practice is widely adopted across different levels in the field of education, which led to coined it as the "New Traditional Model" (Dziuban et al., 2018). Interestingly, Graham reiterated three categories of blended learning system relative to the nature of blended learning; (1) the enabling, which encapsulates the improvements to access and convenience; (2) the enhancing, which explains the incremental but not radical pedagogical change; and lastly (3) the transforming, which concerns more of the radical transformation of pedagogy (Halverson et al., 2017). Nevertheless, despite that the scholars provided the basic nature of blended learning, observing and tracking the growth of this approach is an arduous job due to its ambiguity (Dziuban et al., 2018). This ambiguity has motivated many scholars to redefine this new model in many ways (Okaz, 2015). Furthermore, technological innovation has helped this approach become popular in many e-learning or online courses (Morton et al., 2016). In addition, blended learning has gained importance, especially in the development of online learning and flipped teaching (Wang et al., 2015; Morton et al., 2016). The Department of Education (DepEd) created a program known as the "DepEd Computerization program" that would allow public schools to have computers (DepEd, 2018; Mula & Bucar, 2023; Amit & Pineda, 2021). Ergo effectively improves the quality of education.

Theory of Blended Learning

As innovative technology has started to propagate, blended learning has found its way into adopting these pedagogical concepts (Meier, 2016). Since lecturers or trainers promote the blended learning style, the utilization of this approach to guide students in their innovative activities is more agile and dynamic (Dakhi et al., 2020; Sarfo & Yidana, 2016). Leadership is one of the most highly researched and widely written topics by both academics and practitioners. However, combining leadership and blended learning is a new way to improve students' learning outcomes as they engage in the new approach (Holland & Piper, 2016; Powell et al., 2015; Singh et al., 2021). Thus, a new theory concerning this pedagogical context was generated: "Situational Leadership Theory" (Meier, 2016). This theory explains that when blended learning is introduced to a group of students, the group will foster leaders who acquire new skills and assume new roles in the given task. Blended learning is a broad approach in the pedagogical field; thus, the development of this theory is inevitable in the future (Nworie, 2015).

Blended Learning Models

The first blended learning model is the amalgamation of face-to-face and online learning (Singh et al., 2021; Tratnik et al., 2019). In 2008, the International Association for K-12 Online Learning (INACOL) generated various papers that document the promising practices like online learning, used in the field of K-12 curricula. Combining online and face-to-face learning, made the teaching-learning outcome more productive (Yen et al., 2018), resulted in higher quality outputs, and led to innovative teaching assessments (Karma et al., 2021). With these advantages, local government agencies provide an enormous budget to meet the needs of this new approach model (Powell et al., 2015). Moreover, combining traditional face-to-face and online learning will provide more time for discussion in class (Dumford & Miller, 2018) and more opportunities for students to review concepts and theories outside of physical classrooms (Auster, 2016). The second blended learning model is hybrid learning. It is used to implement a new approach that promotes personalized instruction with some elements of student control over path, pace, time, and place while being protected and supported by schools (Dakhi et al., 2020; O`Byrne & Pytash, 2015). Since the availability of digital gadgets and the internet have enabled access to learning resources, online library and digital media, these have paved the way for education to become more flexible for both lecturers and students. In contrast to conventional classrooms, learning can be limited (Tang & Chaw, 2015).

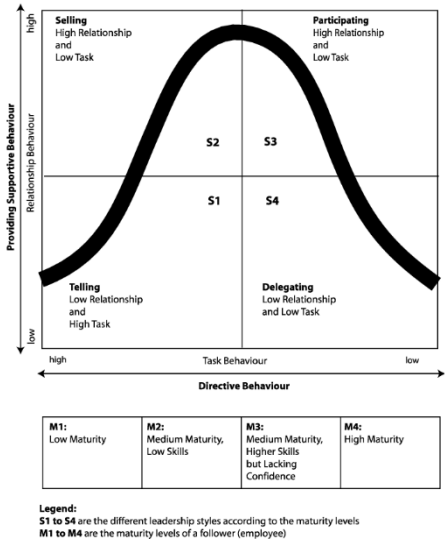

Figure 1. The Situational Leadership Model adapted from Hersey and Blanchard (1977), as cited by Meier (2016).

The other models applied for blended learning are situated levels of blends. The first level of blends is based on activity-lever blending, which occurs when a single learning task combines traditional face-to-face and computer-aided or somehow a combinatorial approach of face-to-face, computer-mediated, and single learning tasks (Halverson et al., 2017).

The second model under the level of blends is the course-level blending. This model involves a course with distinct face-to-face and computer-mediated activities. These two approaches are not homologous even though they involve the same computer-mediated activities. The main difference between these two is that course-level blending has a distinct task that students should undertake (Halverson et al., 2017). Furthermore, program-level blending is defined as a degree program that allows or requires both onsite campus and online courses. Lastly, institutional-level blending encapsulates organizational commitment, such as the requirement that all students take at least one online course to graduate (Halverson et al., 2017).

Besides these situated levels of blends, there are also K-12 models under blended learning K-12 models. There are four major models in the K-12 system. The rotational model involves students rotating between learning modalities on a fixed schedule or at the teacher`s discretion. Nevertheless, this model has sub-models depending on the situation. This can take the form of station rotation, class rotation, flipped classroom, or individual rotation (Halverson et al., 2017). Other flexible, La Carte, and enriched virtual models used in the K-12 system were asserted and could be disruptive and effective over time in transforming education. In addition, scarcity in thematic research remains the major problem with these models; hence, an in-depth approach and knowledge remain vague or unclear.

Blended Learning in K-12

The K-12 definition of Blended learning is for greater attention to the learner`s experiences. Other institutes like Christensen Institute, have defined blended learning based on the learner rather than instructor perspective as “any time a student learns at least in part at a supervised brick-and-mortar location away from home and at least in part through online delivery with some element of student control (Halverson et al., 2017). Technology has begun to change education, affecting how students acquire the skill sets needed to prepare for college and a career and how educators integrate multimedia presentation strategies. The integration of educational technology into K-12 classrooms provides effective teaching lessons and equips students with a dynamic approach to education (Delgado et al., 2015).

Blended learning in K-12 curricula is very different from traditional teaching. As a focal point, seven global themes are identified in the competency domains: pedagogy, management, assessment technology, instructional design, dispositions, and improvement, all conspicuous in K-12 curricula. Because of the blended learning approach, teaching skills for K-12 subjects improve the dynamic nature and personalization of mastery-based learning, data usage and interpretation, LMS, online interactive discussion, and software management of teachers (McAllister & Graham, 2016). In relevance, K-12 teachers have already adopted online/blended classroom learning environments to determine degrees to integrate online teaching styles into the new K-12 approach (McAllister & Graham, 2016). This statement also supports the involvement of K-12 online learning in pedagogies, professional learning, and even policies (Pourreau, 2015). Due to this potential electronically-mediated learning (e-learning), the effective preparation of students for the demands of 21st-century citizenship is facilitated through the affordances of such learning environments in which a theory supports the growth of critical thinking and a personalized educational experience of the stude Greene nts (Greene & Hale, 2017).

Advantages of Blended Learning

As technology dominates the educational system, the blended learning approach has become a matter of considerable interest to teachers around the world (Tosun, 2015). One advantage of blended learning in the field of pedagogy is to address the main issues in modern education, oriented to a competency-based approach, paradigm shifts to student`s self-study training, transfer from the principle of "one education for a lifetime" to "lifelong learning throughout a lifetime", freedom choice of the school, academic flexibility, education computerization, and usage of new information, which is commonly present online. In addition, to amplify the learning of a student, tutor-mediated support can be applied when a student is subjected to blended learning to achieve the desired assessments. Thus, blended learning can provide diverse learning outcomes and ensure students' learning styles (Krasnova & Demeshko, 2015). Moreover, Halverson et al. (2017) categorized blended learning as having benefits such as enhanced pedagogy, improved cost-effectiveness, resource maximization, and increased access and flexibility. Blended learning reduces the seat time of students inside the class and increases the scheduling efficiency of the institution in terms of room availability (Halverson et al., 2017). Another advantage of blended learning is that it enhances students' listening, speaking, reading, and writing skills. Since online courses and subjects are already available online, the enhancement of these skills can occur as they are subjected to a blended learning style (Banditvilai, 2016).

Blended Learning in Post-Pandemic Environments

The Republic Act 10533, also known as the K12 Basic Education Program, introduced a new curriculum by adding two years to Senior High School with a curriculum designed to be subject-centered, learner-centered, and problem-based, in line with various learning theories. However, challenges remain, including below-average national assessment standards, overcrowded classrooms, limited resources, and inadequate ICT infrastructure to maximize these skills. This challenge was further emphasized in the context of the COVID-19 pandemic (Tupas & Linas-Laguda, 2020).

The pandemic in the Philippines has led to lockdowns, and school closures have led to a shift from face-to-face teaching to virtual classrooms through digital platforms. As a result, ICT-related learning tools have become essential across all educational levels, from elementary to higher education (Alcontin, 2021). However, the shift to technology-based education has faced challenges because of connectivity issues and the need for resource realignment (Mukay et al., 2023). To address educational needs while adhering to health protocols, academic institutions have introduced various policies, including the implementation of blended learning. The strategy, as seen as a valuable resource by the Commission on Higher Education, involves the merging of online and offline learning, collaborative and individual learning, structured and non-structured learning environments, and diverse pedagogical approaches like constructivism, behaviorism, and cognitivism, with or without instructional technology, aiming to achieve an optimal learning outcome (Guillen, 2022; Tupas & Linas-Laguda, 2020).

The decline in COVID cases has spurred educational institutions to prepare for the resumption of in-person classes, which demands observations for better strategy implementation. A descriptive study by Singh et al. (2021) discussed a fishbone analysis identifying faculty challenges during the pandemic and detailed Strength-Weakness-Opportunities-Threat analysis, specifically of blended learning. The researchers advocate for the importance of infrastructure development, faculty capacity building, emergency preparedness, and the integration of innovative technology into educational settings to ensure engaging learning experiences. Additionally, the study emphasized the need for mental health support, pedagogical training, and quality assurance methods to ensure continuous improvement in teaching and learning practices. Another study by Sharma (2021)

described blended learning as a critical component in shaping education as schools reopened in India. The author discussed the importance of initiatives to incorporate blended learning into the education system as it is a balanced approach for school re-entry, emphasizing the optimized use of ICT tools to expedite learning. The study also emphasized the use of open educational resources and their overdependence on private digital platforms. The involvement of diverse representatives is also deemed essential in shaping this digital transition, beyond just being driven by technology companies. In addition, blended learning is an effective learning approach to education in the new normal era. It preserves the benefits of in-person interaction while incorporating the flexibility of online learning, making education accessible anytime and anywhere while nurturing essential 21st-century skills in students like critical thinking and problem-solving. Various online platforms, including websites, social networks, and Learning Management Systems (LMS), support this approach (Thahir et al., 2023).

In the Philippines, the government and educational institutions have implemented the resumption of in-person classes with urged post-pandemic initiatives, garnering different perspectives from various stakeholders, mainly focusing on ICT integration. Although the new normal setting offers advantages such as improved learning and increased access to information, the country's ICT infrastructure remains underdeveloped. Teachers and learners face difficulties transitioning to digital learning, requiring technological proficiency and adjustments to the new learning environment (Esterallado, 2021). Alcontin (2021) delved into Philippine teachers' beliefs about digital teaching competence and their preferences for post-pandemic teaching modes. The author highlighted the acknowledgment of technology's role but also the perceived lack of proficiency in digital teaching because competence development relies on professional development programs and individual training. Another paper by Albeta et al. (2023) also reviewed blended learning's impact on learning outcomes, class dynamics, and students and teachers' perceptions. The researchers highlighted the positive influence of technological advancements and innovative teaching methods on learning outcomes and engagement. However, it also highlights negative impacts, such as limited student-teacher interaction and challenges in monitoring students. This review identified obstacles such as ICT skills and inadequate infrastructure for implementing blended learning. In contrast, some studies have indicated that teachers are prepared for the technical aspects and planning, yet slightly less capable of facilitating student-student and teacher-student interaction (Vergonia & Mombas, 2022). Given these conditions, professional development programs and training are necessary to enhance skills for future digital and blended learning activities.

Effects of Blended Learning on Student Motivation to Learn

In the study of Fryer and Bovee (2016), students with prior knowledge of computers and smartphones contributed to teacher support when integrating blended learning in discussions. A total of 975 English-speaking students were subjected to this research. Using Cross-lagged panel structural equation modeling, subject competency tests, and year-end e-learning completion rates, the researchers evaluated the impact of prior experience with computers and smartphones. Their results revealed that perceived teacher support had a broad range of direct and mediated effects on students` motivations for e-learning.

The study of Jou et al. (2016) showed that a blended learning environment with the incorporation of useful web applications generated an effective educational environment capable of improving critical thinking and knowledge and motivating student users. In addition, students were also satisfied with the courses and teaching methods used in the proposed learning environment, which significantly contributed to their learning motivation.

Effects of Blended Learning on Student Achievement/Grades.

The research of Saritepeci & Cakir (2015) examined blended learning environments in middle school student`s engagement and academic performance. Their study used 52 learners (experimental group) and 55 learners (control group). The results showed that students in a blended learning environment experienced exponential growth in average academic performance compared to students in a traditional face-to-face learning environment. In addition,blended learning has a medium-level effect size on the student`s levels of academic achievement. Nonetheless, no statistical differences were observed in the samples; however, the blended learning approach showed a meaningful rise compared to the face-to-face learning approach.

The research of Vo et al. (2017) presented the impact of blended learning on students' academic achievement. This study used 51 effect sizes of students enrolled in STEM programs. The participants were subjected to blended learning in conjunction with traditional classroom instruction. After the execution of the protocol, the results revealed that the students under blended learning conditions exhibited greater learning performance than those under traditional classroom practice. Nevertheless, assessment methods, namely, one-moment and multiple-component assessments, were not significant moderators.

The study of Tseng and Walsh (2016) focused on the level of learning motivation, learning outcomes and skills, and learning achievement. Their study shows that students in blended courses reported higher overall learning motivation than students in traditional courses. Nonetheless, despite the positive note, the data did not show significant differences in the statistical analysis. Interestingly, the students in the blended learning classes indicated that they had positive blended learning experiences and would like to take more blended classes.

Kwak et al. (2015) revealed the impact of blended learning on student performance, based on whether the effect of blended learning is cumulative or not. In addition, blended learning has no impact on student performance if it is not cumulative. It only affects the performance of quizzes associated with a blended learning concept. Nevertheless, if learning is cumulative and impacts the performance of the entire course, the results will have a strong negative effect.

The research of Challob et al. (2016) examined the effects of a collaborative blended learning writing environment on students' writing apprehension and writing performance of students admitted to international schools in Malaysia. The study used semi-structured interviews, learning diaries, and direct observation to assess the effect of collaborative blended learning on the writing apprehension and writing performance of the students. The study was conducted within 13 weeks with 12 male students enrolled, which were further divided into three groups. All participants were subjected to face-to-face and online learning modes to generate authentic data. The results revealed positive perceptions toward the collaborative blended learning writing environment they had experienced. They perceived that the activities helped them reduce their writing apprehension and improve their writing performance when they were subjected to blended learning.

Implementing Blended Learning in High School

The study of Lai and Hwang (2015) revealed the impact of various mobile learning strategies in science courses using blended mobile learning models. A total of 38 selected high schools were subjected to this study to improve teaching plans based on ten mobile learning approaches. The results revealed that most science teachers (40% of the total sample) preferred guided learning in their learning activities. This finding indicates the gap between teachers' ability and their expectations regarding mobile learning activities. Nevertheless, the implementation of mobile learning activities in teaching contexts is feasible and expected to happen because of the positive results of blended learning in relation to the preferences of high school teachers.

The study of Irawan et al. (2017) targets blended learning based on Schoology. Multiple-choice tests were used as a tool to gather participant data. A total of 64 students participated in this research to assess the effects of blended learning on their performance. The study examines blended learning based on Schoology and problem-based learning, the differences in learning outcomes among students with prior knowledge of high, moderate, and low interaction between blended learning based on Schoology and prior knowledge of the learning outcome. The results revealed significant differences in learning outcomes between Schoology-based blended learning and problem-based learning.

RESEARCH METHOD

Identification and Filtration of Potential Literature

The process of identifying relevant literature followed a systematic search strategy. Key databases such as JSTOR, Google Scholar, and ERIC were searched to identify peer-reviewed studies, theses, and conference proceedings on blended learning in pre- and post-pandemic contexts. The search terms used included "*blended learning*," "*hybrid learning*," "*pandemic education*," "*online education pre-pandemic*," and "*post-pandemic educational models*." The search was restricted to literature published between 2010 and 2023 to ensure an up-to-date analysis. In total, 420 articles were initially retrieved.

The filtering process began with an evaluation of titles and abstracts to eliminate studies that did not explicitly focus on pedagogical perspectives of blended learning or were outside the scope of the pre- and post-pandemic periods. Duplicates were also removed during this stage. The initial screening reduced the number of eligible studies to 110.

Eligibility and Inclusion Criteria

To ensure the relevance and rigor of the selected studies, additional eligibility criteria were applied. Studies were conducted based on the following requirements:

- Blended learning pedagogy in primary, secondary, and tertiary educational settings.
- Research design and methodology that demonstrated rigor.
- Inclusion of either pre-pandemic, post-pandemic, or comparative analyses of blended learning.
- Published in English, peer-reviewed, and accessible in full-text.

After applying these eligibility criteria, the final selection comprised 65 of the original 420 articles. These studies provided critical insights into how blended learning approaches have evolved in response to the COVID-19 pandemic and reflected the key pedagogical trends and challenges associated with its implementation.

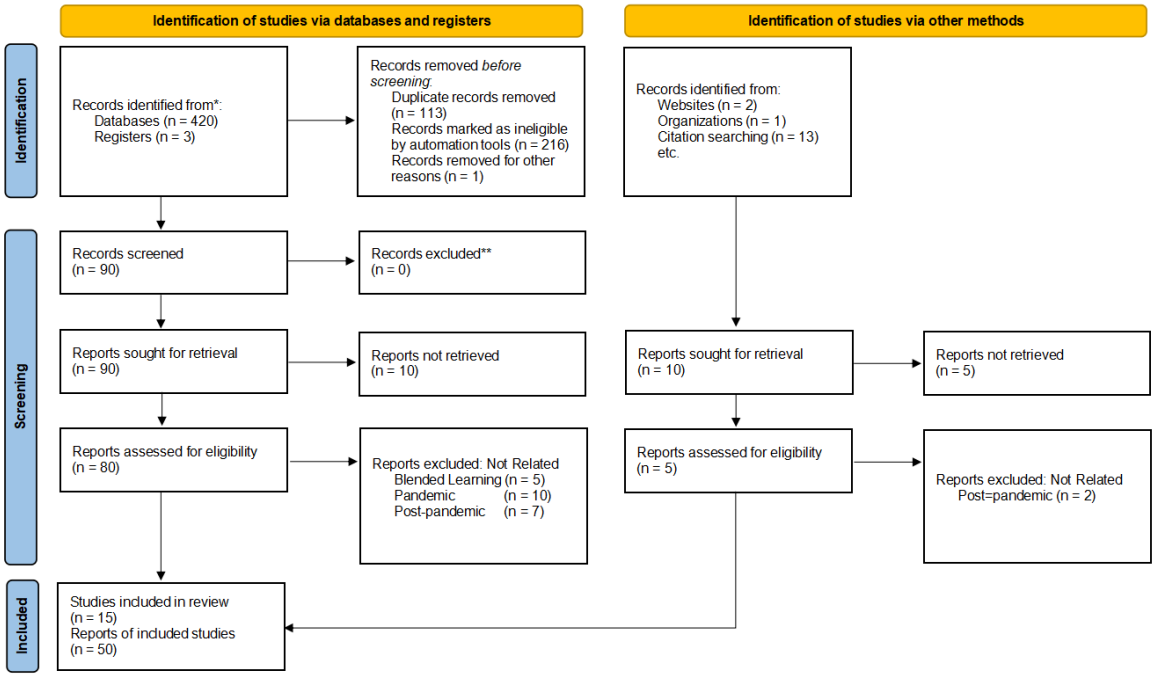

Figure 2: PRISMA Flow Diagram

The PRISMA flow diagram (Fig. 2) illustrates the detailed process of literature identification, screening, and inclusion for this review, ensuring transparency and reproducibility.

Data Extraction and Synthesis

Data extraction from the selected studies was conducted using a standardized form that captured essential information, including the author(s), year of publication, study design, sample size, educational level, employed technological tools, and key findings. A thematic synthesis method was used to uncover recurring themes, challenges, and innovations in blended learning pedagogy before and after the pandemic. The results were categorized into three primary themes: (1) integration of technology, (2) student involvement, and (3) adaptations in pedagogy.

FINDINGS AND DISCUSSION

Thematic Synthesis of Blended Learning Pedagogy: Pre- and Post-Pandemic Perspectives

Based on the literature review, three major themes emerged in relation to blended learning pedagogy: *technological integration*, *student engagement*, and *pedagogical adaptations* (Table 1). Each theme captures the distinct challenges and innovations that have evolved across the pre- and post-pandemic periods.

Table 1. Thematic analysis of selected literature

Technological Integration		Student Engagement		Pedagogical Adaptations	
Pre-pandemic	**Post-pandemic**	**Pre-pandemic**	**Post-pandemic**	**Pre-pandemic**	**Post-pandemic**
Challenges: • **Limited technological access** • **Varying degrees of digital literacy**	**Challenges:** • Unequal access to devices • Low-speed internet • Luddite	**Challenges:** • Passive learners in online activities • Limited interaction	**Challenges:** • Maintain the attention during online • Lack of motivation in online class	**Challenges:** • Resistant to pedagogical changes. • The traditional approach	**Challenges:** • Adapting blended learning remained a challenge • Educators

Technological Integration		Student Engagement		Pedagogical Adaptations	
• **Impeded effective implementation** • **Absence of institutional support**	resisting progress • **Intervention:** • Integration of AI-based learning systems • Utilization of LMS	during asynchronous • Preferred FTF classes	• Difficulty in building rapport • **Innovations:** • Advantage of gamification • Utilization of peer-to-peer learning models in online spaces. • Introduced real-time formative assessment tools	still dominates • Student-centered learning was neglected	had to reframe course designs to accommodate hybrid learning • New design assessments suited for hybrid • **Innovations:** • Apply include flipped classrooms • Used of basic that personalize the learning experience for students based on real-time performance • Educators now emphasize designing courses that integrate both physical and digital learning spaces effectively

Note: FTF=Face-to-Face

The evolution of blended learning pedagogy during the COVID-19 pandemic marks a profound shift in educational practices and priorities. Through thematic synthesis, three key areas emerge, technological integration, student engagement and pedagogical adaptations; demonstrating how blended learning has been fundamentally transformed.

Before the pandemic, the integration of technology into education was largely considered to enhance conventional classroom environments. Many educational institutions faced challenges such as insufficient infrastructure and faculty members' limited familiarity with digital tools, which resulted in technology playing a supplementary role rather than being central to the learning experience. Although Learning Management Systems (LMS) and multimedia resources offer significant potential benefits, their application is often limited, leading to varied outcomes across different educational contexts (Garrison & Vaughan, 2013). The arrival of the pandemic prompted a swift transformation, making technology essential to sustain educational practices. As a result, institutions heavily invest in digital infrastructure and quickly adopt online and hybrid learning models. This rapid shift has led to greater acceptance and use of educational technologies, including

artificial intelligence and personalized learning systems (Hrastinski, 2019). However, despite these advancements, issues surrounding equitable access to technology remain. The digital divide continues to pose a significant challenge, as students from lower-income backgrounds often lack adequate devices or high-speed internet access, underscoring the ongoing need for support and resources to ensure all learners can leverage these technological innovations (Hodges et al., 2020).

Student engagement is essential for effective blended learning. Before the pandemic, many blended learning environments struggled to encourage active student participation, often resulting in passive learning experiences, especially in asynchronous online components (Garrison & Vaughan, 2013). The challenges posed by the pandemic brought high interaction in virtual classrooms to the forefront, prompting educators to explore innovative ways to enhance student involvement. For instance, tools like live polling and breakout rooms have significantly improved how students connect and engage with their peers and instructors (Hrastinski, 2019). Nevertheless, issues such as "Zoom fatigue" and diminishing motivation in fully remote settings have underscored the complexities of sustaining student engagement online (Hodges et al., 2020). Creative solutions such as gamification and peer-to-peer learning have shown promise in making learning experiences more interactive and collaborative. Ultimately, it is vital for educators to regularly evaluate student engagement and refine their teaching strategies to respond effectively to learners' evolving needs and contexts.

The pandemic has driven significant changes in how educators approach teaching, shifting from traditional lecture-based models to more student-centered methodologies (Graham, 2019). Before this upheaval, blended learning was often implemented inconsistently, with teachers experimenting without fully adapting their practices to meet the needs of blended environments. The sudden transition to online learning forced educators to rethink their roles and embrace innovative strategies that emphasize flexibility and independent learning. In the post-pandemic landscape, the rise of flipped classrooms and adaptive learning technologies has marked a notable shift in pedagogy, providing students with more personalized and engaging learning experiences (Kintu et al., 2017). Despite these advancements, challenges still exist, particularly when designing assessments that accurately gauge students' understanding and skills in blended formats. Moving forward, comprehensive learning frameworks must be developed that seamlessly integrate both physical and digital environments while satisfying the diverse needs of all learners.

CONCLUSIONS

The thematic synthesis of blended learning pedagogy, both before and following the pandemic, indicates that although the core components of technological integration, student engagement, and pedagogical adaptations have always been fundamental to blended learning, the pandemic has accelerated their broader adoption and enhancement. Despite the ongoing challenges, particularly concerning equitable access and maintaining student engagement, the innovations that have arisen present hopeful opportunities for the future of blended learning in a post-pandemic environment.

LIMITATION AND FURTHER RESEARCH

This review acknowledges several limitations. First, it focuses on studies published between 2010 and 2023, potentially excluding earlier research that could provide valuable insights into how blended learning has developed over the years. Furthermore, this review primarily draws on English-language studies, which may exclude perspectives from non-English-speaking regions where blended learning may have taken different, yet significant, paths. Many post-pandemic studies reviewed are still recent, offering early insights that might not fully capture the long-term effects of changes in teaching practices during the pandemic.

In future research, it would be beneficial to expand the scope to include earlier studies and non-English research, providing a more inclusive, global perspective on blended learning. Additionally, as innovations such as flipped classrooms and adaptive learning tools continue to evolve, more longitudinal studies are needed to assess their ongoing impact on student outcomes. Lastly, addressing the digital divide is essential to ensure that all students can equally benefit from blended learning, regardless of their access to technology.

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