Hybrid and blended learning in higher education learning institutions: A critical literature comparative review between developing and developed countries

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ABSTRACT

Blended and hybrid learning are now the main digital transformation strategies used by colleges and universities around the world. However, these methods work differently in different parts of the world. The critical literature review evaluates the effects of these models on student participation and educational results and technology adoption in both developed and developing educational settings. The worldwide growth of digital education methods faces research challenges because scientists have not conducted enough comparative studies about how different learning environments affect student results and technology adoption. The review integrates research findings from peer-reviewed studies between 2017 and 2025 through the combination of constructivism with the Community of Inquiry framework and diffusion of innovation theory. The research team found 32 qualifying studies through their systematic searches of the Scopus and Web of Science and ERIC and Google Scholar databases. In developed regions, students benefit from blended and hybrid learning because they have access to strong digital infrastructure, their institutions are prepared, and their teachers receive ongoing professional development, which leads to better student involvement, teamwork, and academic success. Research from developing areas shows that ongoing barriers prevent successful implementation of digital solutions because of weak internet connections, insufficient digital tools, and limited educational resources. Research results indicate that blended and hybrid educational models achieve success through the interaction of three critical factors, which include technological accessibility, faculty skill level, and institutional backing. The review ends with the conclusion that digital ecosystems need to be strengthened alongside pedagogical capacity before technology adoption can lead to successful blended learning for all students worldwide. Academic institutions should provide continued instructional design support, guarantee that staff workload models recognize the demands of multi-modal teaching, and promote interactive learning methods.

Keywords: Blended Learning, Developing Countries, Developed Countries, Hybrid Learning, Higher Education, Learning Institutions

I. INTRODUCTION

Hybrid and Blended learning models are transforming the landscape of higher education by introducing flexible, technology-enhanced approaches that aim to enhance student engagement, access, and learning outcomes. Accelerated by digital transformation and the post-pandemic shift in instructional delivery, higher learning institutions worldwide are increasingly integrating online and face-to-face pedagogies to enhance learner interaction, autonomy, and academic success (Bond et al., 2021; Rasheed et al., 2020). The educational system has adopted blended and hybrid learning methods, which drive instructional design innovation while helping students develop digital skills for their professional futures.

However, despite widespread adoption, significant regional differences continue to exist. The regions of Europe and North America which have higher incomes experience better digital infrastructure and dependable network stability and solid institutional backing that allows them to successfully execute blended and hybrid educational approaches. The digital gap continues to affect educational institutions across Sub-Saharan Africa and South Asia and Latin America because they struggle with restricted technology availability and weak network connections and limited capacity for large-scale digital learning implementation (Adarkwah, 2021; Bozkurt et al., 2020).

The different educational contexts show that a detailed comparison needs to be done to study how blended and hybrid learning systems perform in various higher learning institutions environments. The existing body of research has expanded rapidly but continues to show fragmented results because there are no studies that compare the educational results and technological use of these models between advanced and emerging economies (Ashraf, et al., 2021; Gudoniene et al., 2025). Multiple research studies have shown that learner engagement improves through these methods while students achieve better academic results and develop essential skills (Platonova et al., 2022; Sareen & Mandal, 2024). The results of implementation methods vary because of different educational settings and their existing facilities

and teaching methods and especially in colleges that operate with limited resources. A critical literature review is therefore warranted to consolidate existing evidence, examine cross-regional patterns, and identify factors that influence the effectiveness of blended and hybrid learning. The review advances the field by evaluating these models through two dimensions which assess their educational value and their ability to integrate technology to guide educational practice and policy development and research advancement (Bozkurt et al., 2020).

This research contributes to academic understanding through its unique examination of hybrid and blended learning approaches in higher education. The evaluation method unites systematic search methods with critical thematic analysis to create a method that detects contextual differences which single-region research fails to identify. The research provides higher education institutions with practical knowledge about essential institutional elements which include digital infrastructure and faculty qualifications and design assistance that produce successful student-centered blended learning approaches. The research adds to worldwide digital equity discussions through its examination of how hybrid and blended learning methods create educational disparities based on student access to schools and their financial means and administrative organization of schools. The study establishes essential parameters for educational policy development which require backing from organizational frameworks to deliver blended and hybrid learning systems that align with SDG4 standards for inclusive and resilient education. The paper contains six primary sections. The first section is introduction presents unequal educational opportunities between advanced countries and developing ones and introduces the study problem with its objectives. The second part establishes the theoretical basis by incorporating Constructivism alongside Community of Inquiry (CoI) and Diffusion of Innovation (DoI) for conducting comparative research. The methodology description includes the fundamental literature review framework and search approach and criteria for choosing materials as well as methods for thematic analysis. The study results break down into three main as per objectives. The discussion combines cross-regional data to interpret conclusions through theoretical approaches before explaining policy suggestions and research development needs. The closing section delivers practical guidelines for advancing worldwide adoption of blended and hybrid learning with equity and effectiveness.

1.1 Statement of the Problem

Higher education institutions have adopted blended and hybrid learning at a rapid pace but studies show their success rates differ widely between various global locations and social economic groups. Studies from digitally mature regions reports gains in student engagement, collaboration, and learning outcomes where institutions possess robust digital infrastructure and sustained professional development (Bond et al., 2021; Raes et al., 2020; Howard et al., 2023). Studies from developing nations shows ongoing obstacles to education transformation because of restricted internet access and insufficient technology availability and deficient educational system design and implementation capabilities which lead to blended learning methods that mainly consist of online lecture delivery instead of interactive educational activities (Adarkwah, 2021; Bozkurt et al., 2020; World Bank, 2022). The evaluation of worldwide policies shows these infrastructure and governance deficiencies create additional barriers to equality and block development toward SDG4 (United Nations Environmental, Scientific and Cultural Organization [UNESCO], 2023). Studies into blended and hybrid learning methods has grown yet it exists in separate studies that focus on particular educational settings and there are few comparative analyses that explain why similar models produce different results between developed and developing countries (Platonova et al., 2022; Sareen & Mandal, 2024). The absence of region-specific evidence-based studies prevents policymakers and institutions from creating location-specific strategies which connect technology with teaching methods and institutional resources to produce fair and successful blended learning experiences.

1.2 Research Questions

i. How do hybrid and blended learning models influence student learning and engagement outcomes in higher learning institutions across developing and developed countries?
ii. What technological and institutional drivers support or hinder the effective implementation of hybrid and blended in developing and developed countries?
iii. What are existing gaps in different studies, and areas that require further studies to strengthen equitable adoption of hybrid and blended learning globally?

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Constructivist Learning Theory

Constructivist learning theory serves as a fundamental base to study student knowledge acquisition in blended and hybrid educational settings. The theory bases its foundation on Piaget and Vygotsky's work which shows that students create understanding through active participation and social exchange and self-assessment (Vygotsky, 1978). Learning emerges from the combination of students' existing knowledge with social exchange and mental processes

which leads to ongoing meaning creation rather than direct teacher-to-student knowledge transfer (Efgivia et al., 2020). Contemporary scholars support this view by demonstrating that constructivist learning needs students to engage with real-world tasks and problem-solving and teamwork exercises which develop both critical thinking and deeper understanding (Zajda, 2021; Mishra, 2023). The operationalization of constructivist principles happens through digital and face-to-face learning activities which foster student engagement and independent learning, and social interaction in blended and hybrid educational environments. The theory functions as a tool to assess teaching success within technology-based higher education because it enables the measurement of active student participation and learning independence, and social interaction through digital and face-to-face educational activities.

2.1.2 Community of Inquiry (CoI) Framework

The Community of Inquiry (CoI) framework allows for the evaluation of blended and hybrid learning through its three essential elements which include teaching presence and social presence and cognitive presence (Garrison et al., 2000; Fiock, 2020). The Community of Inquiry framework serves as the primary tool for evaluating online and blended learning quality through its focus on instructional design and facilitation and collaborative learning approaches which produce deep learning experiences. The framework serves as an important tool to study how blended and hybrid learning environments promote student engagement and learning activities and knowledge development while enabling direct comparison of educational quality and student outcomes between different geographic areas (Richardson et al., 2025).

2.1.3 Diffusion of Innovation (DoI) Theory

The Diffusion of Innovation (DoI) theory provides a vital framework to understand how blended and hybrid learning methods spread through different economic regions of the world. The theory of diffusion of innovations (DOI) is the seminal work of communication scholar and sociologist Everette M. Rogers (1931–2004) (García-Avilés, 2020). Diffusion of Innovation (DoI) theory offers an important complementary perspective. According to Rogers (2003) the process of innovation adoption depends on the perceived characteristics of the innovation including relative advantage and compatibility and complexity as well as communication channels and social systems and institutional readiness levels. The adoption of technology-based learning systems by high-income area educational institutions stems from their superior infrastructure and supportive policies and organizational capabilities according to DoI theory in higher education. The adoption process in low- and middle-income regions encounters delays because these areas lack sufficient resources and their digital systems remain underdeveloped and their cultural and organizational systems resist transformation (Adarkwah, 2021; and Bozkurt et al. 2020).

The three theoretical lenses function together to build a solid basis for this review. The educational theory of constructivism demonstrates the mechanisms through which blended and hybrid learning approaches lead to better student achievement. The CoI framework identifies specific environmental factors which produce successful learning outcomes in these educational settings. The Diffusion of Innovation theory explains how different regions adopt new technologies at varying rates because of their economic status. The evaluation of educational methods and technology implementation becomes more comprehensive through the combination of these viewpoints which enables the assessment of blended and hybrid learning success and fairness in higher education through environmental factors.

2.2 Empirical Review

Empirical studies on blended and hybrid learning show that these educational approaches produce different results when used in various geographical locations and institutional settings. Research from technologically advanced higher education systems demonstrates that blended and hybrid approaches can enhance student engagement, interaction, and learning outcomes when supported by adequate infrastructure and coherent instructional design models. Students who have access to well-equipped learning spaces achieve better results through active learning activities and digital tool availability and when online and face-to-face learning methods are properly connected in teaching approaches according to Bond et al. (2021) and Raes et al. (2020). The researchers such as Bond et al. (2021) and Raes et al. (2020) showed that students who study in well-equipped environments achieve better results through active learning methods and continuous digital tool access and proper alignment of online and in-person educational elements. The study by Howard et al. (2023) shows that learning presence quality improves through blended learning implementation when educational institutions have both organizational readiness and digital competence and strategic innovation support.

Research studies conducted in developing countries demonstrate that educational systems and teaching methods create ongoing obstacles which prevent students from achieving success with blended and hybrid learning models. The research findings from Adarkwah (2021) and Bozkurt et al. (2020) indicate that students face reduced learning opportunities because of inadequate internet access and device unavailability and insufficient institutional backing which leads to basic online content distribution instead of active constructivist learning approaches. The problem of digital inequality continues to block fair access to education because UNESCO (2023) and the World Bank (2022) have documented these issues in their worldwide monitoring reports. The conditions create dual obstacles for students to

learn course material and for teachers to develop technology-based learning spaces which support effective teaching methods.

The existing research fails to provide organized comparative studies which show how blended and hybrid educational models deliver different results when used in various educational environments. Platonova et al. (2022) identify methodological and contextual differences in current research yet Sareen and Mandal (2024) argue that studies must examine how institutional readiness and social-economic factors and local policy systems affect the situation. The present empirical research exists in separate sections which insufficiently supports the creation of all-encompassing policy solutions and practical applications. The inconsistent results from different locations show that researchers should perform a thorough review of existing studies to discover how technology and teaching methods and learning environments affect blended and hybrid education success in universities.

III. METHODOLOGY

In this study a critical literature review approach was adopted to analyse and assess existing studies available on hybrid and blended learning models in higher learning institutions. The review adopted systematic search procedures with critical and interpretive of evidence to ensure both depth of analysis and methodological rigour. A literature search was done across major academic database, such as Web of Science, Scopus, AND Google Scholar, focusing on peer-reviewed studies ranging from 2017 to 2025 to capture emerging trends enhanced learning. Search of key terms included combining key words including *"hybrid learning", blended learning", higher education", "developing countries", developed countries" technological enhanced learning" and digital divide"* Table 1.

Table 1

Search String

Main search String	("hybrid learning" OR "blended learning" OR "technology-enhanced learning") AND ("tertiary education" OR "higher education") AND ("developing countries" OR "developed countries" OR "Global North" or Global South") AND ("technology integration" OR "digital divide" "infrastructure") AND "("learning outcomes" OR "student engagement" OR "pedagogical effectiveness)

The main search query focused on educational technology and pedagogical approaches in different learning environments through the combination of the owing search terms: To ensure quality and relevance, inclusion criteria included studies that: (a) reported technological or pedagogical outcomes; (b) focused on hybrid or blended learning within higher education; (c) published in 2017 to 2025; (d) studies specifying its theoretical, empirical or comparative insights applicable to developing and developed countries context (e) peer-reviewed articles, published academic reviews and conference papers, and (f) studies written in English language. Exclusion criteria were (a) research studies done outside higher education such as secondary and primary education, (b) those not written in English, (c) unpublished studies, (d) published before 2017, (e) studies unrelated to hybrid and blended learning, (f) studies with no specification of geographical relevance.

Table 2

Inclusion and Exclusion Criteria

Criteria category	Inclusion criteria	Exclusion criteria
Type of study	Peer-reviewed articles, published academic reviews and conference papers	Unpublished studies
Timeframe	Published in 2017 to 2025	Published before 2017
Context of the study	Research studies focus on higher education institutions (colleges and universities)	Research studies done outside higher education, such as secondary and primary education
Content area	Focused on hybrid or blended learning within higher education	Studies unrelated to hybrid and blended learning
Geographical scope	Studies specifying its theoretical, empirical or comparative insights applicable to developing and developed countries context	Studies with no specification of geographical relevance.
Language	Studies written in English language	Those not written in English

However, systematic review, a PRISMA flow diagram was not used, but to enhance credibility the screening process involved a total of 312 records retrieved from academic data base, whereby after abstract and title screening, 94 studies were retained, 48 were full text level assessed, resulting 32 studies that meet the inclusion criteria. The screening process for titles and abstracts resulted in the exclusion of 218 records because they did not meet the pre-established

criteria for inclusion and exclusion. The methodological framework together with the screening tables established multiple criteria which led to the removal of studies during the screening process. First, a major portion of the studies concentrated on technological tools which did not relate to blended or hybrid learning because they focused on either online education or traditional classroom methods. Second, some studies focused on educational levels other than higher education because they studied primary and secondary and vocational settings which were not included in this review.

Third, the selection process eliminated multiple records because they failed to present adequate information about both established and emerging nations and their educational technology implementation in settings that do not align with workplace training and medical simulation and corporate professional development. Also, the research excluded non-peer-reviewed materials which included theses and reports and grey literature because they did not meet the inclusion criteria. The selection process ended when duplicates from multiple databases and studies published outside the 2017–2025 timeframe were removed. The selection process excluded studies without direct relevance to the research topic and those with poor research quality and studies conducted in different settings which resulted in a focused dataset for full-text evaluation that met the research questions and comparative goals of the review.

The 32 studies included in this review were analyzed by following a structured coding system which matched the theoretical perspectives of Constructivism and CoI and DoI and the research questions. The researchers collected data about study environments and research designs and educational results and technology usage patterns and organizational elements and geographical locations. Thematic analysis emerged through the process of repeated coding which transformed related codes into categories that became dominant themes. The research process produced three main themes which included (1) educational success and student achievement and (2) digital technology implementation and access inequalities and (3) teacher skills and organizational preparedness. The method enabled researchers to establish uniform comparison and synthesis between developed and developing nations. Manual proofreading and automated language consistency checks, such as Grammarly, were carried out to ensure the final document's accuracy and readability. The method led to fewer grammar mistakes while improving study clarity yet maintained all original research content.

IV. FINDINGS & DISCUSSION

4.1 Hybrid and Blended Learning Effectiveness and Student Learning Outcomes

Hybrid and blended learning models have been extensively recognised for their potential to enhance students learning in higher education institutions through interactive, flexible, and learner-centered pedagogies. Evidence from higher education institutions in developed countries especially in North America, Europe, and parts of East Asia, regularly show that these models promote deeper learning, strengthen students engagement, and support higher order cognitive skills such as collaboration, critical thinking, and problem solving (Bond et al., 2021; Nguyen et al., 2022). Effective integration and design of hybrid and blended learning experiences offer different opportunities to students such as self-regulated learning, active participation, and timely feedback, whereby, it contributes to learner satisfaction and improved academic performance. Furthermore, existence of pedagogical training and learning management system in these countries enhances the instructional quality of hybrid and blended learning, enabling universities and colleges to design meaningful learning tasks that facilitate student success (Mohammadi et al., 2025).

In contrast, research studies from developing countries such as, South Asia, Sub-Saharan Africa, and parts of Latin America highlights a mixed results about effectiveness of hybrid and blended models. While several research studies indicate opportunities in terms of student engagement, motivation and collaborative learning, these gains are often constrained but reduced interactivity, limited instructional design, and uneven student preparedness for independent learning (Adarkwah, 2021; Bozkurt et al., 2020). In many developing countries context, blended learning tends to replicate traditional lecture based practices online, resulting artificial engagement rather than transformative learning experiences. Additionally, higher learning institutions lack required infrastructures, instructors struggle to integrate student centered approaches effectively and often lack required training in digital pedagogy, reducing the expected impact of hybrid and blended models on student outcomes (Gray, 2017; Hassler et al., 2020; Bates et al., 2020; El Refae et al., 2021).

A critical comparison across developed and developing countries therefore show that the effectiveness of blended and hybrid learning is strongly context dependent. In environment where students-centred teaching is supported by institutional policies and well embedded, hybrid and blended models are more likely to result in better-quality learning outcomes. However, in developing countries context, limitations in instructional design and pedagogical capacity restrict the potentials of these models. This implies that improving the quality of hybrid and blended learning in resource constrained environment need investment in training, capacity building initiatives and collaborative curriculum design that strengthen instructors' ability to implement active learning strategies that improve student learning.

4.2 Technological Integration and Digital Divide

In developed countries including Europe and North America, the effectiveness of hybrid and blended learning is strongly facilitated by robust digital ecosystem such as dependable learning management systems, high speed connectivity and institution level digital strategies. OECD evidence highlight that most students in OECD countries have both home devise and internet access, showing a long standing institutional readiness and investment in infrastructure. These conditions plays a great role in enabling synchronous hybrid delivery and richer online interaction (Raes et al., 2020; Constantinou, 2023). Global policy analyses similarly emphasize that technology should replace instructor-led instruction and must be governed carefully to serve educational aims, not markets, emphasizing nature policy debates of higher-income settings.

In contrast, higher education system in developing regions such as South Asia, Sub-Saharan Africa and parts of Latin America continue to face digital divides such as limited device and bandwidth access, uneven institutional support for education technology and affordability constraints, limiting both synchronous and asynchronous component of hybrid or blended models. Tawil and Miao (2024) assessment highlight existing inequalities in access and connectivity that translate into unpredictable participation and weaker learning continuity; these gaps were enlarged during COVID-19 pandemic and have continued shaping the current implementation capacity. Evidence on emergency online/remote teaching highlight unevenness in digital skills and technology access, with many countries and institutions adapting under crisis conditions rather than through strategic digital transformation.

Taken together, the nexus between technology and pedagogy are operated differently in both developing and developed countries. In developed countries, staff development and investment in infrastructure, allows institutions to integrated platforms, leverage synchronous-hybrid classroom and data informed support. In developing countries, limited institutional capacity and bandwidth or devise constraints repeatedly lead to digital substitution of lecturers rather than genuine interactive hybrid design. As such, recent world practice highlights that contribution of technology to sustainable development goal 4 on ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all depends on fit-for-purpose design, clear governance, and local condition such as affordability and reliability of access. Therefore, addressing effectiveness challenges in developing countries contexts necessitates concurrent attention to institutional capability, infrastructure, and pedagogical design, rather than technology adoption alone.

4.3 Institutional Readiness and Instructor Competence

In developed countries including Europe, parts of East Asia and North America, instructor competence for hybrid and blended is supported by established design frameworks, professional development, and institutional supports. Research studies report that professional development improves quality of course design digital, ability to coordinate interaction across modalities and pedagogical skills of instructors; where professional development is rooted and iterative, gains in teaching presence, feedback practices and assessment design are most apparent (Howard et al., 2023; Sareen et al., 2024). In similar, education institutions investing in platform integration and classroom support teams report smoother implementation, but also note the complexity of managing multiple modalities and instructors workload without adequate training and staffing (Raes et al., 2020; Santandreu et al., 2023; Wong et al., 2023; Cumming et al., 2024; Kumar et al., 2024).

In developing regions such as South Asia, Sub-Saharan Africa and parts of Latin America instructors recurrently report short term professional development, limited preparedness for technological enhanced pedagogy and constrained access to design support, conditions that narrow hybrid and blended implementation in higher education (Rasheed, et al., 2020; Bozkurt et al., 2020; Adarkwah, 2021; Munoz-Najar et al., 2021). Studies highlights gaps in technological pedagogical content knowledge, facilitation of collaborative online learning, and assessment for blended contexts, together with unequal institutional readiness, in terms of policies, help desk capacity and learning management system integration (Mestan, 2019; Alvarez Jr, 2020; Lie et al., 2023; Tonheim et al., 2024). Studies on readiness highlight how a country policy can lead to institutional capacity yet still requires resourcing and campus level governance to transform in to practice. Instructors also report hidden workload, which without time allocation and policy recognition, reduces adoption and commitment (Raes et al., 2020; Sareen et al., 2024; Ali et al., 2025; Alawadhi, 2024).

Bridging the competence and readiness challenges, it requires a double strategy continued practice based professional development that explicitly develops technological pedagogical content knowledge and blended design expertise. Recent reviews of technological pedagogical content knowledge and blended good practices converge on this alignment; where teacher knowledge, policy signals and organizational infrastructure move in step, hybrid or blended learning shifts from emergency adaptation to durable high quality pedagogy.

4.4 Discussion

4.4.1 Synthesis of Key Findings in Developing and Developed Countries

Even though hybrid and blended learning are often enjoyed as emerging technologies in higher education, the synthesis highlights uneven usage practices. In North America, Europe, and parts of East Asia, hybrid and blended learning have achieved quantifiable gains in student flexibility, engagement, and learning outcomes through focused integration of pedagogy and technology (Raes, 2020; Bond et al., 2021; Howard et al., 2023). Education institutions in developed countries naturally are favored from established digital infrastructures, sustained professional development and established learning management system that enable education institutions to design interactive and constructivist learning environment. These conditions support teaching activities, social and cognitive presences, as well as supporting deeper learner participation and reflection (Garrison et al., 2000). However even within the Global North, researchers caution that effectiveness depends on sustained support and intentional design, lacking these hybrid courses risk reproducing lecture centric patterns in digital form (Santandreu et al., 2023; Constantinou, 2023).

Clear differences emerge when the same models examined in developing countries specifically in South Asia, Sub-Saharan Africa and Latin America. Studies consistently show that institutional such as limited connectivity, sporadic staff training and device shortages hinder pedagogical innovations (Mukhtar et al., 2021; Adarkwah, 2021; Bozkurt et al., 2020). In most cases blended learning signifies posting of lecture materials online rather than the interactive, collaborative designs proposed in constructivist theory. The World Bank (2022) and UNESCO (2023) likewise support that digital divide hinder the equitable realization of sustainable development goals, with learners in bandwidth-poor regions suffering from fragmented participation and lower persistence. As a result, technological affordance that enable pedagogical transformation in digitally mature system often function simply as compensatory tools in resource-constrained environment.

Taken together, evidence from both developing and developed countries show that the success of hybrid and blended learning depends less on technology per se but mostly on institutional readiness, social economic context and pedagogical capacity context. Developed countries prove how constructivist and Community of Inquiry (CoI) aligned practices flourish when supported by clear digital strategy, while developing countries expose the fragility of such models in the absence of education institutions staff empowerment and systematic investment. These findings affirm the need for contextually grounded approaches that view technology integration not as a universal solution but as locally mediated process shaped by infrastructure, governance and professional culture. Addressing these differences is important if hybrid and blended learning are to fulfil their transformative potential rather than underpin existing educational variations (OECD, 2021; UNESCO, 2023).

4.4.2 Theoretical Interpretation and Contributions

The findings of this review prove that the three theoretical underpinnings such as diffusion of innovation, constructivism and community of inquiry framework offers balancing, however context sensitive explanations for the unequal effectiveness of hybrid and blended learning across developing and developed countries exist. In contrast, in developing countries constructivist potential is constrained by inadequate digital literacy, instructor centered pedagogical cultures and infrastructural deficits that persist regardless of the introduction technology. Community of inquiry framework demonstrate valuable for assessing of learning design in both developing and developed countries context, however, the highlight that social and teaching presence are significantly weaker in low resource environments, where instructors are often unable to provide ongoing facilitation, interaction and feedback due to digital barriers and workload pressures (Mukhtar et al., 2021; Adarkwah, 2021). Diffusion of innovation additionally lightens adoption disparities; the relative advantage of hybrid and blended models is clear in global north, yet complexity, compatibility and organisational readiness issues impede uptake and fidelity in Global South. The review therefore, extends existing theory by showing that while community of inquiry and constructivism provide strong experimental and pedagogical explanations, diffusion of innovation is essential for understanding structural, systematic and social-cultural conditions behind the inequitable diffusion of digital pedagogies across higher education system.

4.4.3 Implications of Findings for Policy and Practices

The identified cross regional disparities convey important implications for instructors, higher education institutions and policy makers. First, education institutions must note that technological integration alone is insufficient; investment in digital infrastructure should be complemented by continued professional development that reinforces pedagogical design capacity and strengthens interactive and student centered practice. Institutions development programmes should move beyond one-off technical training toward continues, but practice based support that builds peer collaborations, digital pedagogical competences and mentorship structures. Second, policy makers need to prioritize equitable digital transformation aligned with sustainable development goal 4 on ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all by matching infrastructure investments with strategies that ensure accessibility, affordability, and inclusion for all learners. Regional and national policy

frameworks should address the structural causes of the digital divide to prevent hybrid and blended models from deepening educational inequalities. Third, academic institutions in developing countries need context responsive adaptations rather than direct introduction of global north models. Locally, sustainable designs such as modular blended formats, low bandwidth tools and flexible assessment practices can improve learner engagement and feasibility in resources constrained settings. Collectively, these implications highlight that equitable and effective hybrid and blended learning requires an integrated system approach that aligns technology, support, pedagogy and governance.

4.4.4 Critical Gaps and Future Research Directions

Regardless of growing literature on hybrid and blended learning, significant empirical and conceptual gaps remain. Studies focusing on Global North contexts mostly dominates, limiting generalizability and reinforcing a dominant knowledge paradigm that assumes the transferability of Western designed models. More cross-cultural, comparative and context-sensitive research is required to capture the diverse realities of implementation and leaner experience across regions. Methodologically, the field remains dominated by perception, crosses-section and small-scale based studies that provide limited fundamental insight into learning outcomes or long-term effectiveness. Future research should employ design based, mixed methods and longitudinal approaches to examine how hybrid or blended model evolve over time and how social-cultural and institutional contexts shape success. Theoretically, stronger integration of equity, socio-cultural and decolonial perspective is needed to compliment constructivist and community of inquiry based interpretations particularly in global south contexts. Furthermore, research studies should focus on voices from underrepresented regions, incorporating locally relevant pedagogies, indigenous knowledge systems, and alternative innovations pathways. Addressing these gaps will support a more globally relevant and inclusive evidence base capable of enlightening equitable digital transformation of higher education.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This critical literature review examined the effectiveness of hybrid and blended learning models in higher education across developing and developed countries, with an emphasis on pedagogical impacts and technological integration. Findings demonstrate that while these models hold considerable promise for enhancing flexibility, student engagement and learning outcomes, their success remains highly context dependent. In countries with advanced digital technology such as North America, Europe and East Asia, hybrid and blended learning benefit from established institutional strategies, continues professional development and strong technological infrastructure, that support student centered pedagogies. In contrast, implementation in South Asia, Sub-Saharan Africa and Latin America is often constrained by inadequate access to devices, insufficient capacity for digital pedagogical design and limited connectivity, resulting in more superficial or lecture-based form blended learning. These disparities highlight that technology-enhanced learning is not inherently transformative; rather its impact is shaped by social-economic conditions, the quality of pedagogical support and institutional readiness.

5.2 Recommendations

To strengthen the effectiveness of and equity of hybrid and blended learning, higher education systems should adopt a holistic approach that aligns pedagogy, capacity building and technology. Investment in affordable digital and reliable infrastructure remains important, particularly in developing countries, together with continuous, and practice based professional development to improve educators' digital pedagogical competencies. Academic institutions should provide continued instructional design support, guarantee that staff workload models recognise the demands of multi-modal teaching and promote interactive learning methods. Institutional leaders and policy makers are recommended to pursue context-responsive approaches rather than duplicate models developed in digital mature system, by prioritising inclusive digital access, low-bandwidth solutions and locally relevant implementation pathways. Such coordinated efforts are important to ensure that hybrid and blended learning contribute importantly to enhanced learning experiences and to the realization of more inclusive and equitable higher education.

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