TRANSFORMING INCLUSIVE EDUCATION FOR LEARNERS WITH MULTIPLE DISABILITIES: EMERGING INNOVATIONS AND FUTURE DIRECTIONS

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Abstract - Inclusive education is a global priority for achieving equitable and quality education for all learners; however, learners with multiple disabilities continue to encounter significant barriers to meaningful participation, learning, and social inclusion. Addressing these challenges requires innovative, learner-centered approaches that extend beyond conventional inclusive practices. This conceptual paper examines emerging innovations and future directions for transforming inclusive education for learners with multiple disabilities. Drawing on recent international literature, policy frameworks, and theoretical perspectives, the paper critically synthesizes advances in inclusive pedagogy, Universal Design for Learning (UDL), assistive technology, artificial intelligence (AI), digital accessibility, collaborative teaching, and interdisciplinary support. It proposes the Transformative Inclusive Education Framework (TIEF), which integrates innovative pedagogy, technology-enabled learning, teacher competence, collaborative partnerships, and inclusive policy to strengthen educational accessibility, participation, and personalized learning. The paper argues that meaningful inclusion requires not only physical access to education but also equitable participation, individualized support, and sustained institutional commitment. It highlights the need to strengthen teacher education, promote inclusive policies, and ensure the ethical integration of emerging technologies. By providing a comprehensive conceptual framework and identifying future priorities for research, policy, and practice, this paper contributes to the advancement of sustainable, equitable, and high-quality inclusive education for learners with multiple disabilities.

Keywords: Inclusive Education; Learners With Multiple Disabilities; Universal Design For Learning; Artificial Intelligence; Assistive Technology; Teacher Education; Transformative Inclusive Education Framework (Tief).

I. INTRODUCTION

Inclusive education has become a global educational priority aimed at ensuring equitable, accessible, and high-quality learning opportunities for all learners, regardless of disability, gender, socioeconomic status, language, or cultural background. International frameworks, including the Salamanca Statement, the United Nations Convention on the Rights of Persons with Disabilities (CRPD), and Sustainable Development Goal 4 (SDG 4), emphasize that education systems must eliminate barriers to learning and promote the meaningful participation of every learner in inclusive settings (United Nations, 2006; UNESCO, 2020). Contemporary perspectives further recognize that inclusive education extends beyond school enrolment to encompass equitable participation, academic achievement, social inclusion, and lifelong learning (UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025).

Among learners with disabilities, those with multiple disabilities represent one of the most educationally disadvantaged groups because they experience the combined effects of two or more impairments, including intellectual, sensory, physical, communication, or developmental disabilities. These complex and diverse needs require individualized instruction, multidisciplinary collaboration, accessible learning environments, and continuous educational support. Consequently, traditional instructional approaches are often inadequate, highlighting the need for learner-centred and collaborative models of inclusive education (United Nations, 2006; UNESCO IITE, 2025).

Inclusive education has evolved from a policy-driven focus on school access to a transformative approach that values learner diversity, educational equity, and meaningful participation. This paradigm shift encourages educators to redesign curricula, instructional strategies, assessment practices, and learning environments to accommodate learner variability from the outset rather than relying on individual accommodations (UNESCO, 2020; Zhang et al., 2024). A key development supporting this transformation is Universal Design for Learning (UDL), which promotes flexible curriculum design through multiple means of engagement, representation, and action and expression. Evidence indicates that UDL enhances instructional accessibility and learner engagement when supported by adequate teacher preparation and institutional commitment (Zhang et al., 2024).

Rapid technological advancement has further transformed inclusive education. Emerging innovations—including artificial intelligence (AI), assistive technologies, adaptive learning systems, augmentative and alternative communication (AAC), virtual reality (VR), and digital accessibility tools—

offer significant opportunities to personalize learning, enhance communication, improve accessibility, and foster learner independence. However, their effectiveness depends on ethical implementation, equitable access, digital accessibility, and teachers' technological competence (Karakose et al., 2024; Pagliara et al., 2024; UNESCO IITE, 2025).

Despite these advances, the implementation of inclusive education for learners with multiple disabilities remains constrained by inadequate teacher preparation, limited access to assistive technologies, insufficient interdisciplinary collaboration, resource limitations, and inconsistent policy implementation. Teacher competence is widely recognized as a critical determinant of successful inclusion, requiring expertise in inclusive pedagogy, differentiated instruction, assistive technology integration, collaborative practice, and evidence-based teaching strategies (UNESCO IITE, 2025; Zhang et al., 2024).

Although previous studies have examined inclusive pedagogy, UDL, AI, assistive technologies, and teacher competencies independently, there remains limited conceptual integration of these innovations into a unified framework specifically addressing learners with multiple disabilities. Addressing this gap, the present conceptual paper synthesizes recent international literature and proposes the Transformative Inclusive Education Framework (TIEF), which integrates pedagogical innovation, emerging technologies, teacher competence, collaborative partnerships, and inclusive policy to guide future research, educational practice, and policy for sustainable and equitable inclusive education.

II. STATEMENT OF THE PROBLEM

Inclusive education is internationally recognized as a fundamental strategy for ensuring equitable, accessible, and quality education for all learners. Global policy frameworks, including the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and the Education 2030 Framework for Action, emphasize that every learner should have equal opportunities to access, participate in, and succeed in education (United Nations, 2006; UNESCO, 2020). Despite these policy commitments, many education systems continue to face challenges in translating inclusive education policies into effective classroom practices, particularly for learners with multiple disabilities.

Learners with multiple disabilities experience complex educational, communication, sensory, physical, and social needs that require individualized instruction, multidisciplinary collaboration, accessible learning environments, and continuous educational support. However, inadequate teacher preparation, limited access to assistive technologies, insufficient institutional resources, and inconsistent implementation of inclusive policies continue to hinder their meaningful participation and educational achievement (UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025).

Recent innovations, including Universal Design for Learning (UDL), artificial intelligence (AI), assistive technologies, adaptive learning systems, and digital accessibility, have created significant opportunities to enhance inclusive educational practices. Nevertheless, their implementation remains constrained by infrastructural limitations, unequal access to technology, ethical concerns, and limited teacher competencies (Pagliara et al., 2024; UNESCO IITE, 2025).

Although existing research has examined these innovations independently, there remains limited conceptual integration of pedagogical, technological, collaborative, and policy dimensions into a comprehensive framework tailored to learners with multiple disabilities. This gap restricts the development of evidence-informed educational practices and coherent policy implementation. Therefore, there is a need for an integrated conceptual framework that synthesizes these dimensions to strengthen equitable participation, personalized learning, and sustainable inclusive education for learners with multiple disabilities.

III. OBJECTIVES OF THE STUDY

The present conceptual paper aims to:

1. To examine the concept and contemporary perspectives of inclusive education for learners with multiple disabilities.
2. To critically review emerging innovations, including inclusive pedagogies, Universal Design for Learning (UDL), assistive technologies, artificial intelligence (AI), and digital accessibility that support the education of learners with multiple disabilities.
3. To analyse the role of teacher competencies, interdisciplinary collaboration, and inclusive educational policies in transforming educational practices for learners with multiple disabilities.
4. To identify the existing challenges and gaps in implementing innovative inclusive education practices for learners with multiple disabilities.
5. To propose a comprehensive conceptual framework that integrates pedagogical, technological, and policy innovations for strengthening inclusive education.
6. To suggest future directions and recommendations for educators, researchers, teacher education institutions, and policymakers to promote equitable, accessible, and sustainable

inclusive education for learners with multiple disabilities.

IV. REVIEW OF LITERATURE

Recent scholarship recognizes inclusive education as a transformative approach that promotes equity, accessibility, meaningful participation, and quality learning for all learners. International policy frameworks emphasize that effective inclusion extends beyond physical placement in mainstream classrooms and requires learner-centred pedagogies, accessible learning environments, collaborative practices, and supportive educational policies (United Nations, 2006; UNESCO, 2020; UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025). For learners with multiple disabilities, individualized educational planning, differentiated instruction, multidisciplinary collaboration, and continuous support are essential to address their diverse learning needs (UNESCO, 2020).

The literature identifies Universal Design for Learning (UDL) as a key framework for designing flexible and accessible curricula through multiple means of engagement, representation, and action and expression, thereby enhancing learner participation and instructional accessibility (Zhang et al., 2024). Simultaneously, emerging technologies—including artificial intelligence (AI), assistive technologies, adaptive learning systems, augmentative and alternative communication (AAC), virtual reality (VR), and digital accessibility tools—have expanded opportunities for personalized learning, communication, and learner engagement, although their effectiveness depends on ethical implementation, equitable access, and teacher competence (Pagliara et al., 2024; UNESCO IITE, 2025). Furthermore, teacher competencies in inclusive pedagogy, differentiated instruction, assistive technology integration, and collaborative practice remain critical to successful implementation, highlighting the importance of continuous professional development and interdisciplinary partnerships (Florian & Black-Hawkins, 2011; Sharma et al., 2022).

V. RESEARCH GAP

Existing research has significantly advanced inclusive education through studies on inclusive pedagogy, Universal Design for Learning (UDL), assistive technologies, artificial intelligence (AI), teacher competencies, and educational policy. However, these areas have largely been examined in isolation, resulting in fragmented knowledge that provides limited guidance for addressing the complex and multidimensional needs of learners with multiple disabilities (Florian & Black-Hawkins, 2011; UNESCO, 2020). Although emerging technologies and innovative pedagogical approaches have shown considerable potential for improving accessibility, participation, and personalized learning, limited research has integrated these dimensions into a comprehensive conceptual framework that simultaneously addresses pedagogy, technology, teacher preparedness, interdisciplinary collaboration, and policy implementation (Jaakkola, 2020; UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025).

Furthermore, learners with multiple disabilities remain underrepresented in the literature, with most studies focusing on specific disability categories or isolated educational interventions (Sharma et al., 2022; Zhang et al., 2024). Consequently, there is a need for an integrated framework that explains how educational innovations, collaborative practices, institutional capacity, and inclusive policies collectively support sustainable inclusion. Addressing this gap, the present conceptual paper proposes the Transformative Inclusive Education Framework (TIEF) to guide future research, teacher education, educational practice, and policy development for learners with multiple disabilities.

VI. THEORETICAL FRAMEWORK

This conceptual paper is grounded in an integrated theoretical framework comprising the Social Model of Disability, Sociocultural Theory, Universal Design for Learning (UDL), and Ecological Systems Theory. Together, these complementary perspectives provide a holistic foundation for understanding learner diversity, educational accessibility, collaborative learning, and systemic support for learners with multiple disabilities.

The Social Model of Disability emphasizes that disability arises primarily from environmental and institutional barriers rather than individual impairments, advocating the removal of barriers to ensure equitable participation (Oliver, 1990; United Nations, 2006). Sociocultural Theory explains that learning is fostered through social interaction, collaboration, and guided support, highlighting the importance of inclusive learning environments and meaningful participation (Vygotsky, 1978). Universal Design for Learning (UDL) promotes flexible curriculum design by providing multiple means of engagement, representation, and action and expression, thereby enhancing accessibility and personalized learning (CAST, 2024; Zhang et al., 2024). Ecological Systems Theory further emphasizes that learner development is shaped by interactions among families, schools, communities, and policy environments, underscoring the importance of interdisciplinary collaboration and institutional support (Bronfenbrenner, 1979).

Collectively, these theoretical perspectives provide the foundation for the proposed Transformative Inclusive Education Framework (TIEF), which integrates pedagogical innovation, emerging technologies, collaborative practices, and inclusive policies to advance equitable and sustainable inclusive education.

VII. CONCEPTUAL FRAMEWORK

Drawing upon the reviewed literature and the integrated theoretical framework, this paper proposes the Transformative Inclusive Education Framework (TIEF) as a holistic model for advancing inclusive education for learners with multiple disabilities. The framework conceptualizes inclusive education as an interconnected system in which innovative inclusive pedagogies, emerging educational technologies, teacher competencies, collaborative support systems, and inclusive policies interact to enhance accessibility, participation, personalized learning, and educational outcomes. Unlike conventional models that primarily emphasize classroom inclusion, TIEF adopts a systems-oriented perspective by integrating pedagogical, technological, institutional, and policy dimensions into a unified framework.

The five interrelated pillars of TIEF include: (a) innovative pedagogies, such as Universal Design for Learning (UDL), differentiated instruction, and learner-centred approaches; (b) emerging technologies, including artificial intelligence (AI), assistive technologies, adaptive learning systems, and digital accessibility; (c) teacher competence and continuous professional development; (d) interdisciplinary collaboration among educators, families, therapists, and community stakeholders; and (e) inclusive policies and institutional support that promote equitable access and sustainable implementation (Bronfenbrenner, 1979; CAST, 2024; Sharma et al., 2022; United Nations, 2006; UNESCO, 2020).

Collectively, these interconnected pillars create an adaptive and evidence-informed ecosystem that promotes meaningful participation, learner engagement, self-determination, academic achievement, and lifelong inclusion. The proposed TIEF provides a practical conceptual foundation for guiding future research, teacher education, educational leadership, and policy development in inclusive education.

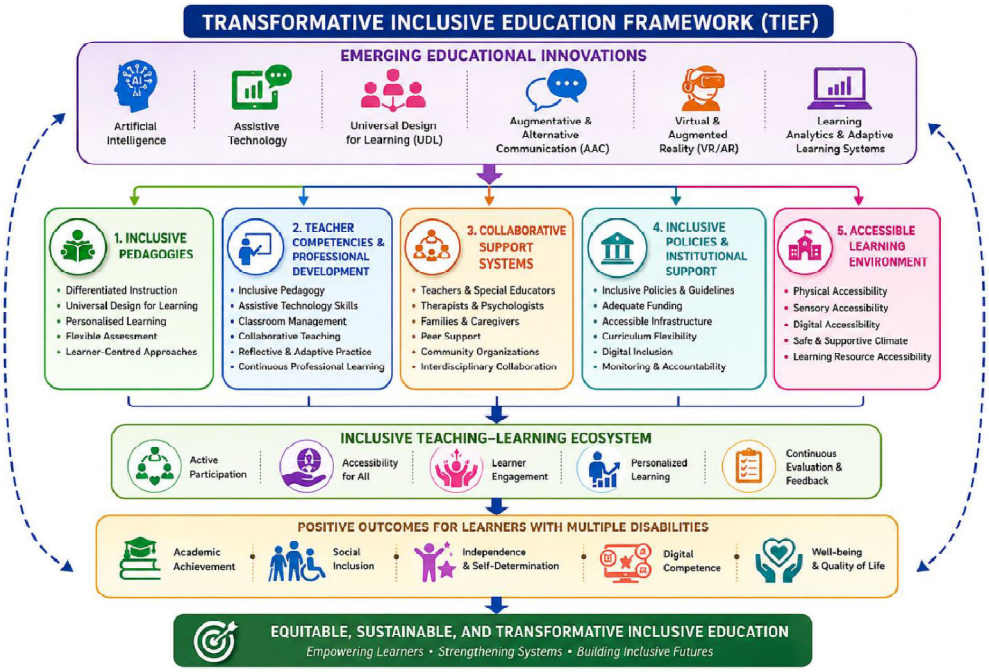


Figure 1. Transformative Inclusive Education Framework (TIEF) for Learners with Multiple Disabilities

The Transformative Inclusive Education Framework (TIEF) illustrates how emerging educational innovations, inclusive pedagogies, teacher competencies, collaborative support systems, inclusive policies, and accessible learning environments collectively enhance participation, accessibility, personalized learning, and learner well-being, ultimately promoting equitable and sustainable inclusive education for learners with multiple disabilities.

VIII. METHODOLOGY

Methodology

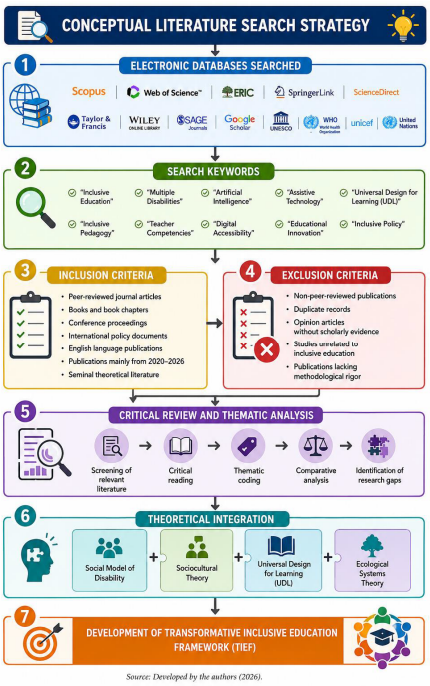
This study adopts a conceptual paper methodology to examine emerging innovations in inclusive education for learners with multiple disabilities and to propose a Transformative Inclusive Education Framework (TIEF). A conceptual approach is appropriate because it facilitates the integration of existing theories, research evidence, policy perspectives, and

contemporary educational practices to develop a comprehensive understanding of the phenomenon (Jaakkola, 2020). Rather than generating primary empirical data, conceptual papers synthesize and critically interpret existing knowledge to advance theory, inform practice, and identify future research directions. The paper is based on a narrative review and critical synthesis of the literature. Relevant scholarly publications were identified through electronic databases, including Scopus, Web of Science, ERIC, Springer Link, Taylor & Francis Online, Science Direct, Wiley Online Library, SAGE Journals, and Google Scholar. In addition, reports and policy documents published by international organizations such as UNESCO, the United Nations, the World Health Organization (WHO), and UNICEF were reviewed to provide global perspectives on inclusive education. The literature search focused on publications from 2020 to 2025, while seminal theoretical works and international policy documents were included where necessary to establish the conceptual and theoretical foundations of the study. Keywords used during the search included inclusive education, multiple disabilities, artificial intelligence, assistive technology, Universal Design for Learning, inclusive pedagogy, teacher competencies, digital accessibility, educational innovation, and educational policy. Only peer-reviewed journal articles, scholarly books, conference proceedings, and authoritative international reports published in English were considered.

The selected literature was analysed using a thematic analysis approach. The reviewed studies were systematically examined to identify recurring concepts, emerging innovations, implementation challenges, and future priorities related to inclusive education for learners with multiple disabilities. The identified themes were then organized into broader conceptual categories, including innovative pedagogies, educational technologies, teacher competencies, collaborative support systems, and inclusive policies. These thematic categories informed the development of the proposed Transformative Inclusive Education Framework (TIEF).

To enhance the conceptual rigor of the paper, the synthesis was guided by four complementary theoretical perspectives: the Social Model of Disability, Socio-cultural Theory, Universal Design for Learning (UDL), and Ecological Systems Theory. Integrating these perspectives enabled the development of a holistic framework that explains how pedagogical, technological, institutional, and policy-related factors interact to strengthen inclusive education for learners with multiple disabilities.

The conceptual framework presented in this paper was developed through an iterative process of literature synthesis, theoretical integration, and critical reflection. It is intended to provide a foundation for future empirical research, educational policy development, teacher education, and evidence-informed inclusive practices aimed at improving educational outcomes for learners with multiple disabilities.



Source: Developed by the authors (2026).

Figure 2 illustrates the conceptual literature search and synthesis process adopted in this study. Although the present work is not a systematic review, a transparent and structured approach was employed to identify, screen, critically analyze, and synthesize contemporary literature from major academic

databases and international policy documents. The synthesized evidence informed the development of the proposed Transformative Inclusive Education Framework (TIEF), ensuring methodological transparency and conceptual rigor (Jaakkola, 2020; Snyder, 2019; Webster & Watson, 2002).

IX. CRITICAL ANALYSIS AND DISCUSSION

The reviewed literature indicates that transforming inclusive education for learners with multiple disabilities requires a shift from traditional support models to integrated educational systems that prioritize equity, accessibility, participation, and personalized learning. Although international policy frameworks have strengthened the foundation of inclusive education, effective implementation continues to depend on teacher preparedness, institutional capacity, collaborative practices, and evidence-based pedagogical innovation rather than policy commitments alone (United Nations, 2006; UNESCO, 2020).

A key finding is the growing emphasis on learner-centered approaches, particularly Universal Design for Learning (UDL), differentiated instruction, and flexible curricula, which promote meaningful participation by reducing instructional barriers (CAST, 2024; Zhang et al., 2024). Emerging technologies-including artificial intelligence (AI), assistive technologies, adaptive learning systems, and augmentative and alternative communication (AAC)—further enhance accessibility, communication, and personalized learning. However, their educational effectiveness depends on ethical implementation, equitable access, digital accessibility, and teacher competence (Pagliara et al., 2024; UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025).

The analysis also highlights the importance of interdisciplinary collaboration among educators, families, therapists, and policymakers in supporting holistic learner development (Bronfenbrenner, 1979). Despite considerable advances, existing research largely addresses pedagogy, technology, teacher education, and policy as separate domains, limiting the development of coordinated inclusive practices. The proposed Transformative Inclusive Education Framework (TIEF) addresses this gap by integrating these interconnected dimensions into a unified model that strengthens accessibility, participation, learner engagement, and educational equity. This integrated perspective provides a practical and theoretical foundation for advancing inclusive education through coordinated research, teacher education, institutional leadership, and evidence-informed policy implementation.

X. IMPLICATIONS OF THE STUDY

The proposed Transformative Inclusive Education Framework (TIEF) has significant implications for theory, educational practice, teacher education, and policy development. Theoretically, it advances inclusive education by integrating the Social Model of Disability, Socio-cultural Theory, Universal Design for Learning (UDL), and Ecological Systems Theory into a unified framework that explains how pedagogical innovation, technology, collaboration, and institutional support collectively enhance educational outcomes for learners with multiple disabilities (Bronfenbrenner, 1979; Florian & Black-Hawkins, 2011; Jaakkola, 2020).

From a practical perspective, the framework provides educators and school leaders with a systematic approach to designing learner-centered, accessible, and technology-enabled learning environments through the integration of UDL, artificial intelligence (AI), assistive technologies, and collaborative practices (CAST, 2024; Pagliara et al., 2024). It also underscores the need for teacher education programmes to strengthen competencies in differentiated instruction, inclusive assessment, digital accessibility, AI literacy, and interdisciplinary collaboration (Sharma et al., 2022; UNESCO, 2020).

For policymakers, TIEF highlights the importance of inclusive policies, accessible infrastructure, equitable digital access, sustainable investment, and continuous institutional support. These measures can strengthen evidence-informed implementation of inclusive education and contribute to achieving equitable, high-quality education in line with Sustainable Development Goal 4 (SDG 4) (United Nations, 2015; UNESCO, 2020).

XI. RECOMMENDATIONS

Based on the conceptual analysis and the proposed Transformative Inclusive Education Framework (TIEF), several recommendations are offered to strengthen inclusive education for learners with multiple disabilities. First, teacher education institutions should enhance pre-service and in-service programmes by integrating inclusive pedagogies, Universal Design for Learning (UDL), differentiated instruction, assistive technologies, artificial intelligence (AI), and inclusive assessment to strengthen teachers' competencies in responding to diverse learner needs (UNESCO, 2020; UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025).

Second, educational institutions should promote the ethical and equitable use of emerging technologies, ensuring that AI, assistive technologies, adaptive learning systems, and digital accessibility tools are implemented within inclusive and learner-centered environments (Pagliara et al., 2024). Third, schools should adopt UDL principles in curriculum design, instructional practices, and assessment to minimize

learning barriers and maximize learner participation (CAST, 2024; Zhang et al., 2024). Fourth, interdisciplinary collaboration among teachers, special educators, therapists, families, school leaders, and community organizations should be strengthened to support coordinated educational planning and holistic learner development. Finally, governments and educational institutions should reinforce inclusive policies through sustainable funding, accessible infrastructure, digital inclusion, continuous professional development, and evidence-based monitoring. Future interdisciplinary research should evaluate the long-term effectiveness of innovative pedagogies and emerging technologies in improving educational outcomes for learners with multiple disabilities (United Nations, 2006; UNESCO, 2020).

XII. LIMITATIONS OF THE STUDY

Although this conceptual paper provides a comprehensive synthesis of contemporary literature and proposes the Transformative Inclusive Education Framework (TIEF), several limitations should be acknowledged. First, the study is conceptual in nature and does not include primary empirical data to validate the proposed framework. Consequently, the relationships among the identified components remain theoretically derived and require empirical verification across diverse educational settings (Jaakkola, 2020).

Second, the analysis primarily draws upon peer-reviewed literature, international policy documents, and scholarly publications published in English. Relevant studies published in other languages or unavailable through the selected databases may therefore not have been included. Additionally, the rapidly evolving nature of artificial intelligence, assistive technologies, and digital learning environments means that new innovations may emerge beyond the scope of the literature reviewed in this study (Pagliara et al., 2024; UNESCO IITE, 2025).

Finally, although the proposed framework is intended to have broad applicability, its implementation may vary according to national policies, institutional resources, technological infrastructure, cultural contexts, and teacher preparedness. Future empirical research, including longitudinal, mixed-methods, and cross-cultural studies, is therefore needed to examine the validity, effectiveness, and adaptability of the Transformative Inclusive Education Framework (TIEF) in different educational contexts (UNESCO, 2020; Zhang et al., 2024).

XIII. FUTURE DIRECTIONS

The future of inclusive education for learners with multiple disabilities depends on developing educational systems that are innovative, equitable, technology-enabled, and learner-centred. Future efforts should move beyond ensuring access to education and focus on creating inclusive learning ecosystems that foster meaningful participation, personalized learning, social inclusion, and lifelong educational success (United Nations, 2006; UNESCO, 2020).

Emerging technologies, including artificial intelligence (AI), adaptive learning systems, assistive technologies, virtual and augmented reality, and learning analytics, offer considerable potential to improve accessibility and individualized learning. Future research should examine their effectiveness, ethical implications, accessibility, and long-term educational impact across diverse contexts (Pagliara et al., 2024; UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025). Equally important is strengthening teacher education through competencies in Universal Design for Learning (UDL), inclusive pedagogy, AI literacy, digital accessibility, and interdisciplinary collaboration (CAST, 2024; Zhang et al., 2024).

Future studies should adopt interdisciplinary, comparative, and longitudinal approaches to evaluate innovative inclusive practices and inform evidence-based policy. Particular attention should be given to validating the proposed Transformative Inclusive Education Framework (TIEF) across diverse educational and cultural contexts. Empirical evaluation of the framework will contribute to theory development while providing practical guidance for educators, researchers, and policymakers. Advancing inclusive education ultimately requires sustained collaboration, ethical innovation, and policy commitment to ensure equitable and high-quality learning opportunities for all learners.

XIV. CONCLUSION

Inclusive education has moved beyond a policy commitment to become a learner-centred approach that promotes equity, accessibility, participation, and quality education for all. This conceptual paper examined how emerging educational innovations can improve inclusive education for learners with multiple disabilities. Based on recent research, international policy frameworks, and established theories, it proposed the Transformative Inclusive Education Framework (TIEF), which integrates inclusive pedagogy, Universal Design for Learning (UDL), artificial intelligence (AI), assistive technologies, teacher competencies, collaborative partnerships, and inclusive policies into a comprehensive model for strengthening inclusive education (United Nations, 2006; UNESCO, 2020).

The review indicates that meaningful inclusion requires more than physical access to schools. Learners with multiple disabilities need flexible teaching strategies, personalized learning, accessible learning environments, interdisciplinary collaboration, and continuous educational support. Although emerging technologies provide new opportunities to improve accessibility, communication, participation, and learning outcomes, their successful use depends on ethical implementation, equitable access, institutional support, and well-prepared teachers (Pagliara et al., 2024; UNESCO Institute for Information Technologies in Education [UNESCO IITE], 2025).

A major contribution of this paper is the development of the Transformative Inclusive Education Framework (TIEF), which brings together pedagogical, technological, collaborative, and policy dimensions within a single conceptual model. The framework offers practical guidance for educators, researchers, teacher educators, and policymakers in designing more inclusive and sustainable educational systems. Overall, transforming inclusive education requires coordinated efforts, continuous innovation, and evidence-based practice to ensure that learners with multiple disabilities can participate fully, achieve their potential, and experience equitable, high-quality education.

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