

Innovation in Inclusive Education: A Systematic Literature Review on Strategies, Challenges, and Implementation

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Abstract

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Inclusive education serves as a fundamental pillar in establishing an equitable, fair, and diversity-respecting educational system that acknowledges the varied backgrounds and needs of learners. Although it has become a global commitment, the implementation of inclusive education across countries continues to face various challenges, ranging from structural issues such as limited infrastructure, technical issues like the low competency of educators, to cultural barriers, including resistance to diversity. This study aims to map innovative strategies, key obstacles, and implementation practices of inclusive education through a systematic literature review of scholarly. The literature was sourced from leading academic databases and analyzed thematically. The findings reveal that strategies such as the use of assistive technologies, flexible curricula based on universal design, capacity building of teachers through inclusive pedagogy training, and cross-sector collaboration significantly enhance the quality of inclusive education implementation. These results affirm that the success of inclusive education heavily relies on the integrated and continuous synergy of policies, technology, and human resources, rather than relying solely on normative policy frameworks

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1. Introduction

Inclusive education has become a global commitment aimed at establishing a fair, equitable, and diversity-oriented educational system. It is grounded in the principle that all children, including those with special educational needs, deserve equal learning opportunities within mainstream school settings. Inclusive education involves not only physical integration but also social acceptance, active participation, and support for individual learner needs (Vetoniemi & Kärnä, 2021). As such, it demands a reform in mindset, pedagogical practices, and the structure of policies and educational institutions.

In the 21st century, marked by rapid technological advancement, educational systems are encountering new challenges and opportunities (Schmidt & Tang, 2020). Digital transformation offers great potential for inclusive education by enabling adaptive, flexible, and personalized learning environments. Technologies such as assistive tools, learning management systems, and AI-powered platforms make learning more responsive to diverse student needs (Whalley et al., 2021). Pedagogical innovations have also brought new approaches to curriculum design, assessment strategies, and inclusive learning practices (Ramya, 2023).

Despite the prominence of inclusive education in global agendas and its inclusion in Sustainable Development Goal 4 (SDG 4), implementation at the institutional level continues to face numerous obstacles. These include limited infrastructure, lack of teacher competence, cultural resistance to diversity, and incomplete or unsustainable policy implementation. In many cases, inclusive education is practiced merely as a formality, without the systemic change needed to

support meaningful inclusion. This results in a gap between the ideals of inclusive education and actual practices on the ground.

Although many studies on inclusive education have been conducted from theoretical, practical, and policy-based perspectives, several significant research gaps remain. First, there is a lack of comprehensive reviews that systematically compile and synthesize the latest innovations in inclusive education. Most existing studies are localized and based on specific school cases, making it difficult to generalize or draw global conclusions about what strategies succeed or fail. Second, while many studies focus on the barriers to inclusive education, they often overlook the links between innovative strategies and the outcomes of implementation. Identifying successful practices is essential for informing education policies that are responsive to learner diversity.

Third, current literature shows a lack of integration between technological, policy, and field-based dimensions. Studies that examine technological innovations in inclusive education often operate in isolation and are not linked to policy challenges or educator readiness. This creates a cross-sectoral gap, even though a holistic understanding is vital for building a robust inclusive education framework. Fourth, systematic literature review (SLR) studies specifically focusing on inclusive education in the context of 21st-century innovations are still scarce. Existing reviews tend to focus on general education or special education without explicitly highlighting the synergy between inclusion, innovation, and implementation.

By identifying these gaps, this study aims to make both academic and practical contributions to the literature on inclusive education through structured scientific

evidence. The research will systematically map the innovations, challenges, and implementation practices related to inclusive education over the past decade. Specifically, it aims to identify and categorize innovative strategies implemented across countries or institutions, including the use of technology, curriculum models, teaching methods, and stakeholder collaboration; analyze major challenges in implementation in terms of policy, human resources, organizational culture, and social resistance; and evaluate the effectiveness of inclusive education implementation and the factors influencing its success or failure.

Additionally, this study seeks to formulate strategic recommendations for governments, educational institutions, NGOs, and teachers to develop more adaptive, innovative, and sustainable inclusive education systems. Using the SLR approach allows for a comprehensive synthesis of research findings, offering reflective insights into which practices can be replicated, adapted, or abandoned. The study is expected to contribute theoretically to the discourse on inclusive education, serve as a practical reference for stakeholders, and lay a foundation for future research in assistive technology, inclusive teacher training, and evidence-based policy evaluation.

2. Methods

This study employs the Systematic Literature Review (SLR) approach as the core research method to comprehensively identify, evaluate, and synthesize various academic sources that are relevant to the theme of innovation in inclusive education. The selection of this method is based on its strength in offering a structured,

transparent, and evidence-based framework for mapping existing scholarly work in a given field. As emphasized by Shaffril et al. (2021), the SLR method is especially valuable for constructing a comprehensive understanding of a topic through a rigorous process of literature selection, analysis, and synthesis, allowing researchers to produce scientifically grounded conclusions and recommendations.

The implementation of the SLR in this study follows a structured sequence of stages to ensure accuracy and clarity in the development of findings. The initial stage involves the identification and selection of literature, carried out by conducting a series of systematic searches using four major academic databases: Google Scholar. These databases were selected due to their wide coverage of high-quality publications in the fields of education and innovation. During the search process, specific inclusion criteria were applied, a direct focus on inclusive education and innovation, and the use of English or Indonesian as the language of publication. Based on this search strategy, a total of 124 articles were identified as potentially relevant for further analysis.

The next stage involves the screening and qualification of the selected articles to ensure relevance and eliminate redundancy. Articles were carefully examined by reviewing their titles, abstracts, and keywords, as well as their core content. Duplicate articles and those not aligning with the study's focus were excluded, resulting in a final selection of 20 high-quality articles deemed most relevant for in-depth analysis. In the final stage, a thematic analysis was conducted to identify emerging patterns and classify the literature into key themes. The themes that surfaced through this process include innovations in inclusive education strategies, challenges in

implementation, and factors influencing the success or failure of inclusive practices. This analytical process forms a comprehensive knowledge base that supports the formulation of evidence-based strategic recommendations to advance inclusive education in diverse contexts.

3. Results and Discussion

3.1 Teacher Capacity Development, Cross-Sectoral Collaboration, Implementation Challenges, Practice Inequality, and Infrastructure and Resource Limitations

Innovative strategies in inclusive education depend heavily on teacher readiness and competence in diverse classrooms. One main finding highlights the critical need for teacher capacity development through inclusive pedagogy training (Moriña, 2022). Such training introduces special needs awareness, assistive technology use, differentiated instruction, and collaborative class management. Countries like Australia and Canada have mandatory inclusive education training for teachers before licensing. In Indonesia, inclusive education policies exist, but large-scale teacher training remains limited, especially in remote areas. Studies reveal that trained teachers tend to show positive attitudes toward students with special needs and apply more adaptive teaching strategies.

Inclusive innovation also appears through stakeholder collaboration. Schools alone cannot meet all the needs of students with special needs. Thus, partnerships with parents, healthcare workers, educational psychologists, social services, and local authorities are essential. Evidence shows that structured collaborative models

increase learning support effectiveness, reduce social exclusion, and enhance service sustainability. A practical model includes school-based student support teams comprising classroom teachers, special assistants, counselors, and parents. These teams develop Individualized Education Programs (IEPs) and oversee appropriate interventions. Scandinavian countries exemplify cross-sector collaboration integrated into school systems, where regular joint meetings between teachers and medical staff are standard for evaluating student development. Multidisciplinary efforts like these strengthen inclusive education's substance.

This review reveals that policy alone isn't sufficient creative and committed implementation of diverse and sustainable approaches is crucial. Technology, curriculum flexibility, teacher training, and cross-sector collaboration form the core of an inclusive and compassionate education system. These insights offer a valuable foundation for designing inclusive and effective education policies. Despite these developments, inclusive education still faces substantial field-level challenges. These challenges are not only technical but also structural, cultural, and policy-related, leading to a gap between inclusive ideals and practice. The literature consistently identifies four dominant barriers: limited infrastructure and resources, low teacher competence, socio-cultural resistance, and weak integrated policies.

One clear obstacle is the lack of infrastructure and resources, particularly in developing countries. Remote and underdeveloped schools often lack physical facilities to support students with special needs (Suroyyah & Harmanto, 2022). Many schools still do not offer essential features like ramps, elevators, accessible toilets, or supportive classrooms for students with mobility impairments. Assistive

technologies such as screen readers and hearing aids are scarce and unevenly distributed. The shortage also applies to human resources, with many schools lacking special education teachers or professionals such as psychologists and speech therapists. This inequality further widens the gap between well-equipped and under-resourced schools, resulting in significant disparities in both access to and the quality of education available to children with special needs (Strum et al., 2021). In under-resourced schools, the absence of essential facilities such as accessible classrooms, specialized equipment, and assistive technologies combined with a lack of trained professionals like special education teachers, speech therapists, and educational psychologists, severely limits students' ability to participate fully in learning. These students often face systemic barriers that compromise their academic development and social inclusion. As a result, their educational experiences are not only unequal but also insufficient to meet their individualized learning needs.

3.2 Lack of Teacher Competence Awareness, Social and Cultural Resistance, Absence of a Firm and Integrated Policy

Besides infrastructure, low teacher competence remains a critical barrier. Many mainstream teachers have not received sufficient training in pedagogical and psychological aspects of inclusive education. Most still rely on uniform teaching methods and lack differentiated instruction practices (Kurniawati, 2021; Matolo & Rambuda, 2022). Their understanding of inclusivity as a philosophy is also limited some see special needs students as a burden rather than part of classroom diversity. This stems from pre-service teacher education programs that often fail to integrate inclusive education into the curriculum. Consequently, teachers may feel

unprepared, uncomfortable, or reluctant in inclusive settings. This lack of preparation affects not just instruction, but also assessment methods, classroom dynamics, and the broader school climate. As a result, students with special needs are often marginalized or denied full participation in school life due to teachers' inadequate knowledge of inclusion.

Social and cultural resistance also hinders implementation. In many regions especially conservative ones stigma and discrimination against students with disabilities remain strong (Kwok & Ching, 2022). Some parents oppose having their children in inclusive classes, believing it will affect learning negatively. Within schools, children with special needs may experience bullying, exclusion, or negative labeling sometimes from educators themselves. This non-inclusive culture creates emotionally unsafe spaces, discouraging students who need additional support. Even when schools are labeled inclusive, such attitudes undermine real inclusion and instead foster hidden segregation. This highlights that inclusive education is not just about infrastructure or policy it also requires cultural transformation and social acceptance of diversity as a strength.

Another major challenge is the absence of clear, operational, and integrated policies. Although many countries have ratified frameworks like the Convention on the Rights of Persons with Disabilities (CRPD) and adopted Sustainable Development Goal 4, implementation is often weak due to the lack of detailed technical guidelines. Many inclusive education policies remain abstract and fail to address critical aspects such as facility standards, special teacher workloads, or adaptive assessment strategies (Kende, 2021). Furthermore, coordination among

sectors like education, health, and social affairs is often fragmented. This disjointedness makes inclusive services inaccessible and inefficient. Budget allocations for inclusive education are also typically low and not prioritized, limiting long-term innovation and practice. Without strong policy backing and sufficient funding, localized inclusive efforts struggle to survive or scale.

The study shows that inclusive education faces deeply connected systemic issues. Infrastructure deficits, low teacher readiness, cultural resistance, and weak policies are key barriers to meaningful and equitable inclusion. The gap between inclusive ideals and school-level realities reflects this complexity. To address this, comprehensive cross-sectoral strategies are necessary strategies that go beyond technical solutions to also engage structural reform and cultural shifts. Only then can inclusive education be implemented sustainably, equitably, and effectively across diverse educational contexts.

4. Conclusion

Inclusive education is a strategic effort to create an equitable, just, and diversity-respecting educational system. The background of this study is based on the reality that, although the principle of inclusivity has become a global commitment and part of the Sustainable Development Goals (SDG 4), its implementation still faces various structural, cultural, and technical challenges. This study aims to provide a systematic mapping of innovative strategies, implementation challenges, and best practices in inclusive education through a Systematic Literature Review of academic literature over the past decade. The findings reveal that several

innovative strategies have been developed and have shown effectiveness in supporting inclusive education.

These strategies include the use of assistive technology and digital learning, flexible curriculum design based on Universal Design for Learning (UDL), capacity building for teachers through inclusive pedagogy training, and structured cross-sectoral collaboration. However, the study also identifies serious challenges in implementation, such as limited infrastructure and resources, low teacher competence and awareness, sociocultural resistance to diversity, and suboptimal integrated and operational policies. The implications suggest that the success of inclusive education depends not only on technological innovation or policy, but on the comprehensive integration of human resource readiness, school culture transformation, and intersectoral coordination. This study recommends strengthening practice-oriented inclusive policies, systemic teacher capacity development, and the creation of adaptive and inclusive educational technology platforms. For future research, it is recommended to explore integration models between technology, policy, and classroom practice in greater depth. Action research and longitudinal studies are also essential to assess the long-term impact of innovative strategies in diverse geographical, social, and economic contexts.

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