



Bridging Policy and Practice: A Systematic Literature Review on Dual-Approach Educational Innovation

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Abstract

Educational innovation has become a crucial strategy for improving learning quality and strengthening schools' capacity to respond to rapid technological and societal changes. This study aims to analyze the implementation strategies of educational innovation through top-down and bottom-up approaches, identify the factors influencing their effectiveness, and propose an integrated implementation model based on recent empirical evidence. The study employed a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines. Relevant articles published between 2022 and 2026 were systematically retrieved from Google Scholar, Scopus, ERIC, ScienceDirect, and SpringerLink using predefined search terms related to educational innovation and implementation strategies. The findings reveal that the top-down approach provides strategic policy direction, standardized implementation, and institutional resource support, whereas the bottom-up approach promotes teacher participation, contextual problem-solving, and innovation driven by local needs. Leadership, teacher competence, organizational culture, and technological infrastructure were identified as the primary enabling factors, while resistance to change and limited resources remained the most significant challenges. The study implies that integrating top-down and bottom-up approaches can establish a balanced, adaptive, and sustainable framework for implementing educational innovation and enhancing school effectiveness across diverse educational contexts.

Article History

Received : July 2025
Revised : October 2025
Accepted : December 2025

Keywords:

Educational Innovation, Top-Down Approach, Bottom-Up Approach, School Improvement

INTRODUCTION

Educational innovation has become a strategic priority for education systems worldwide as societies confront rapid technological advancement, economic transformation, and evolving workforce demands. Schools are increasingly expected to cultivate competencies that extend beyond academic achievement, including critical thinking, creativity, collaboration, communication, and digital literacy, all of which are considered essential for twenty-first-century citizenship and lifelong learning (Mendieta, 2025). Responding to these expectations requires educational institutions to redesign learning environments, instructional practices, and organizational processes. Recent studies emphasize that innovation in education is no longer limited to introducing new technologies but also encompasses pedagogical renewal, organizational restructuring, and leadership transformation that collectively improve educational quality (Abichandani et al., 2022). Consequently, educational innovation has become a fundamental mechanism for strengthening institutional resilience, enhancing learning effectiveness, and ensuring that schools remain responsive to changing societal expectations. These developments demonstrate that innovation is not merely an optional improvement strategy but an essential component of sustainable educational development capable of addressing increasingly complex educational challenges.

Despite the growing recognition of educational innovation, many schools continue to encounter substantial challenges in translating innovative ideas into sustainable educational practices. The increasing adoption of digital learning platforms, artificial intelligence, learning management systems, and other educational technologies has transformed teaching and learning processes across various educational contexts (Betancur et al., 2022). In parallel, recent educational policies have placed greater emphasis on digital transformation as a means of improving educational quality and institutional effectiveness (Sari et al., 2025). Evidence from the OECD (2023) further demonstrates that educational innovation contributes significantly to learning effectiveness and institutional capacity when implemented successfully. Nevertheless, research published between 2022 and 2025 consistently reports that innovation initiatives frequently encounter obstacles such as limited financial and technological resources, insufficient teacher readiness, weak organizational culture, and inconsistent leadership support, reducing the effectiveness and sustainability of innovation programs (Witjaksono & Amir, 2022). These findings suggest that successful educational innovation depends not only on innovative concepts but also on implementation strategies capable of managing organizational change effectively.

Existing literature has extensively examined educational innovation from multiple perspectives, including digital transformation, technology integration, innovative pedagogy, educational leadership, curriculum reform, and organizational improvement. Numerous studies have explored innovation through policy implementation, digital learning environments, and school leadership practices, demonstrating the significant contribution of innovation to improving educational performance (Cabral-Gouveia et al., 2023; Penelitian et al., 2023). Recent investigations also indicate that top-down implementation strategies provide policy consistency, standardized procedures, and efficient dissemination of educational reforms across institutions (Surawan & Saputra, 2025; Faizah et al., 2026). Conversely, other studies

highlight that bottom-up approaches encourage teacher participation, contextual problem solving, and stronger ownership of innovation because ideas emerge directly from classroom experiences and local educational needs (Deacon et al., 2022; Mpuangnan & Roboji, 2024; Kitani, 2025). Although these studies provide valuable insights into educational innovation, they generally examine each implementation approach independently, resulting in fragmented knowledge regarding how different implementation strategies influence innovation success across diverse school contexts.

Although previous studies have enriched the discussion on educational innovation, important conceptual and empirical gaps remain. The growing body of literature primarily emphasizes the effectiveness of individual innovation initiatives, digital technologies, leadership practices, or curriculum reforms, while limited attention has been devoted to systematically comparing implementation strategies from both top-down and bottom-up perspectives. Existing findings are therefore dispersed across different educational settings and theoretical frameworks, making it difficult to identify the respective strengths, limitations, enabling factors, and implementation challenges of each approach (Jauhari et al., 2025). Furthermore, studies frequently examine policy-driven reforms or school-based initiatives in isolation, resulting in insufficient understanding of how both approaches can complement one another in supporting sustainable educational change (Rosário & Dias, 2024). This fragmentation restricts the development of comprehensive implementation frameworks that can guide policymakers, school leaders, and teachers in designing innovation strategies that are both contextually responsive and institutionally sustainable.

To address these limitations, this study proposes a comprehensive synthesis of recent evidence on educational innovation implementation by integrating findings from both top-down and bottom-up perspectives within a single analytical framework. Unlike previous reviews that focus primarily on specific innovations or particular educational contexts, this study systematically examines the characteristics of each implementation approach, the organizational and contextual factors influencing implementation success, the barriers encountered during innovation processes, and the potential integration of both approaches into a coherent implementation model. Through this perspective, the study advances the current literature by positioning educational innovation not merely as a policy initiative or a school-level practice but as a multidimensional organizational process requiring strategic coordination across different levels of educational governance. This integrated perspective represents the study's state of the art by offering a broader conceptual understanding of educational innovation implementation based on evidence published between 2022 and 2026.

Based on these considerations, this study aims to analyze educational innovation implementation strategies through top-down and bottom-up approaches using a Systematic Literature Review guided by the PRISMA 2020 framework. Specifically, the study examines the implementation characteristics of both approaches, identifies the supporting factors and challenges influencing innovation success, and develops an integrated framework for implementing educational innovation in school settings (Suyo-Vega et al., 2024). The underlying argument of this study is that neither top-down nor bottom-up approaches are independently sufficient to ensure sustainable educational innovation. Instead, combining centralized policy

direction with active participation from teachers and school communities is expected to produce more adaptive, effective, and sustainable innovation outcomes. By synthesizing contemporary evidence, this study contributes theoretically to expanding the discourse on educational innovation implementation and provides practical recommendations for policymakers, school leaders, and teachers seeking to strengthen the effectiveness and long-term sustainability of innovation initiatives in diverse educational contexts.

RESEARCH METHOD

This study used the Systematic Literature Review (SLR) method to examine various studies discussing educational innovation implementation strategies through top-down and bottom-up approaches. This method was chosen because it allows for a systematic and comprehensive synthesis of knowledge based on published research findings. The review process referred to the PRISMA 2020 guidelines as a reference for the identification, selection, and analysis of literature. Article searches were conducted through Google Scholar, Scopus, ERIC, ScienceDirect, and SpringerLink databases. Keywords used included educational innovation implementation, top-down innovation, bottom-up innovation, school innovation, and educational change.

The article selection process was conducted based on established inclusion and exclusion criteria. The selected articles were scientific publications from the 2022–2026 period that discussed the implementation of educational innovation in the school context and examined top-down, bottom-up, or a combination of both approaches. Articles that were irrelevant to the research focus, duplicated, or unavailable in full text were excluded from the review process (Riddel & Zulfikar, 2024). Data from the selected articles were then extracted and categorized based on the research objectives, methods, and key findings. Next, the data was analyzed using thematic analysis techniques to identify patterns and produce a synthesis regarding educational innovation implementation strategies through top-down and bottom-up approaches.

RESULT AND DISCUSSION

Result

Characteristics of Educational Innovation Implementation Through a Top-Down Approach

The literature consistently identifies the top-down approach as one of the dominant strategies for implementing educational innovation during the 2022–2026 period. In this approach, innovation is initiated through policies formulated by governments, education authorities, or school leadership and subsequently disseminated to schools for implementation (De Lima Pontes et al., 2025). Recent studies indicate that large-scale reforms, including educational digitalization, the implementation of the Independent Curriculum, technology-based teacher professional development, and the modernization of school administrative systems, are commonly executed through centralized decision-making mechanisms (Mani, 2025). Such initiatives enable educational systems to establish common objectives, standardized implementation procedures, and measurable performance indicators across schools (Arias et al., 2025). Furthermore, centralized governance facilitates resource allocation, regulatory consistency, and systematic monitoring, enabling

policymakers to coordinate innovation implementation more efficiently across different educational levels. These characteristics demonstrate that the top-down approach is particularly effective for implementing reforms requiring policy alignment, institutional coordination, and large-scale organizational change.

Despite these advantages, the reviewed literature also highlights several limitations associated with policy-driven innovation. Educational reforms implemented predominantly through centralized authority often provide limited opportunities for teachers and other educational stakeholders to participate in planning and decision-making processes (Baig & Yadegaridehkordi, 2023). As a result, teachers frequently become passive recipients of innovation rather than active contributors to educational change, reducing their sense of ownership and commitment toward newly introduced programs (Dalimunthe et al., 2025). Several empirical studies further reveal that insufficient participation frequently contributes to resistance during implementation, particularly when educational reforms are perceived as externally imposed rather than collaboratively developed (Akimov et al., 2023). This resistance may manifest through reluctance to adopt new pedagogical practices, inconsistent implementation, or superficial compliance with policy requirements. Consequently, policy effectiveness cannot be measured solely by the quality of regulations but must also consider how implementation processes encourage stakeholder engagement and institutional acceptance.

The synthesis further suggests that the effectiveness of the top-down approach depends largely on the interaction between centralized policy direction and organizational readiness within schools. Although standardized regulations provide strategic clarity and ensure consistency in educational reform, successful implementation requires leadership practices capable of translating policy objectives into meaningful actions at the school level. School leaders play a crucial mediating role by communicating innovation goals, providing professional support, and creating collaborative environments that encourage teachers to implement reforms effectively. The reviewed studies collectively indicate that schools demonstrating stronger internal communication and greater stakeholder involvement experience fewer implementation barriers despite operating under centralized policy frameworks (De Lima Pontes et al., 2025; Arias et al., 2025). Therefore, the literature suggests that the top-down approach should not be viewed merely as hierarchical policy enforcement but as a governance strategy whose effectiveness depends on participatory leadership, organizational capacity, and continuous collaboration among all educational stakeholders.

Characteristics of Educational Innovation Implementation Through a Bottom-Up Approach

The literature characterizes the bottom-up approach as an implementation strategy that places teachers, educational staff, students, and the wider school community at the center of educational innovation. Unlike centralized policy-driven reforms, this approach encourages innovation to emerge from the practical challenges encountered in everyday teaching and learning activities (Auliya et al., 2023). Teachers are provided with greater autonomy to design instructional strategies, integrate digital technologies, and develop learning innovations that reflect students' needs and local educational contexts (Feri et al., 2025). This participatory orientation allows schools to generate solutions that are responsive to contextual conditions rather than relying

exclusively on externally determined policies. Furthermore, the active involvement of multiple stakeholders strengthens collective responsibility for educational improvement and creates opportunities for continuous reflection throughout the implementation process. These characteristics position the bottom-up approach as an adaptive implementation strategy that emphasizes professional autonomy, contextual responsiveness, and collaborative problem-solving within educational institutions.

A recurring finding across the reviewed studies is that stakeholder participation significantly enhances the sustainability of educational innovation. Because teachers and school communities are directly involved in identifying problems, designing interventions, and evaluating implementation outcomes, innovations developed through this approach tend to generate stronger ownership and institutional commitment (Putera et al., 2025). Such ownership encourages teachers to continuously refine instructional practices and adapt innovations to changing educational demands without depending solely on external directives. Several studies further demonstrate that contextual innovations are generally more flexible because they are developed according to school characteristics, available resources, and student learning needs rather than standardized implementation procedures (Munawir et al., 2025). Teacher creativity therefore becomes a critical determinant of implementation success, enabling educational institutions to respond more effectively to diverse classroom situations and rapidly evolving educational environments (Nufus & Azis, 2025). These findings reinforce the importance of professional agency in promoting continuous educational improvement.

Despite its strengths, the literature also identifies several limitations associated with the bottom-up approach. Innovations initiated at the school level frequently depend on the availability of institutional support, financial resources, and enabling policy environments. Without adequate governmental or organizational backing, many locally developed innovations remain confined to individual schools and experience difficulties in scaling up or being replicated across different educational settings (Alberto et al., 2024). Variations in teacher competence, leadership capacity, and technological infrastructure further contribute to uneven implementation outcomes among schools. Consequently, while the bottom-up approach effectively promotes contextual innovation and stakeholder engagement, its long-term sustainability often requires stronger coordination with higher-level educational policies and resource allocation mechanisms. The reviewed literature therefore suggests that locally initiated innovations achieve greater impact when supported by broader institutional frameworks capable of facilitating dissemination, capacity building, and continuous organizational learning across diverse educational contexts.

Factors Supporting the Implementation of Educational Innovation

The literature consistently identifies school leadership as one of the most influential factors in determining the successful implementation of educational innovation. Effective school leaders play a strategic role in establishing a clear vision for change, communicating innovation goals, mobilizing institutional resources, and fostering collaboration among teachers and other stakeholders (Damenu et al., 2025). Rather than functioning solely as policy implementers, principals are expected to become change agents who facilitate organizational learning and encourage continuous improvement throughout the innovation process. Studies further indicate that leadership contributes significantly to creating an organizational climate that is open to

experimentation, reflective practice, and collaborative decision-making. Such conditions enable schools to respond more effectively to emerging educational challenges while maintaining consistency in innovation implementation. These findings demonstrate that leadership is not merely an administrative function but a transformational capacity that shapes institutional readiness and strengthens the sustainability of educational innovation across diverse educational contexts.

Another critical enabling factor highlighted across the reviewed studies is teacher competence. As the primary implementers of educational innovation, teachers determine whether policy initiatives and instructional reforms are translated into meaningful classroom practices (Terminanto et al., 2025). The literature emphasizes that successful innovation requires teachers to possess not only pedagogical expertise but also digital competence, adaptive thinking, and the ability to integrate emerging technologies into teaching and learning activities. Continuous professional development and collaborative learning opportunities further strengthen teachers' readiness to adopt innovative instructional approaches and respond to changing educational demands. In addition, schools characterized by supportive organizational cultures tend to encourage knowledge sharing, professional collaboration, and collective problem-solving, creating an environment where innovation can flourish. Consequently, teacher competence and organizational culture operate as complementary factors that reinforce one another, enabling educational institutions to sustain innovation beyond the initial stages of implementation.

The reviewed literature also demonstrates that technological infrastructure and institutional resources provide the operational foundation necessary for successful educational innovation. Schools with adequate digital facilities, reliable internet connectivity, and sufficient learning resources are generally better positioned to implement technology-enhanced teaching and administrative innovations effectively (Awang et al., 2025). Similarly, access to appropriate technological tools supports teachers in developing interactive learning experiences and facilitates collaboration among educational stakeholders (Crawford, 2025). However, these studies suggest that infrastructure alone cannot guarantee successful implementation. Sustainable innovation emerges from the interaction between supportive leadership, competent human resources, collaborative organizational culture, and adequate technological capacity. The synthesis therefore indicates that educational innovation should be viewed as a multidimensional organizational process requiring alignment between policy support, institutional capacity, and professional competence. Strengthening these interconnected factors creates a more resilient foundation for implementing and sustaining innovation within schools.

Barriers to the Implementation of Educational Innovation

The literature consistently identifies resistance to change as one of the most significant barriers to the successful implementation of educational innovation. Resistance frequently arises when teachers and educational staff perceive innovation as disrupting established instructional routines or increasing professional responsibilities without sufficient institutional support (Laksmi & Astuti, 2024). Several studies indicate that educators who have long relied on conventional teaching methods often experience difficulties adapting to new pedagogical approaches, digital technologies, and revised curriculum requirements. These challenges become more pronounced when innovation initiatives are introduced without adequate professional development, mentoring, or opportunities for collaborative learning. As a result, implementation may be

characterized by delayed adoption, inconsistent classroom practices, or partial compliance with institutional expectations. The reviewed literature therefore suggests that resistance should not merely be interpreted as individual reluctance but rather as an organizational challenge requiring continuous communication, capacity building, and supportive leadership to facilitate successful educational transformation.

Beyond individual resistance, the literature emphasizes that inadequate infrastructure and limited institutional resources substantially constrain educational innovation. Schools with insufficient digital facilities, unreliable internet connectivity, or restricted access to instructional technologies often encounter considerable difficulties in implementing innovation programs, particularly those dependent on digital learning environments (Gudoniene et al., 2025). These limitations reduce teachers' opportunities to integrate technology effectively into classroom practice and frequently widen disparities in innovation implementation across educational institutions. Furthermore, differences in human resource capacity, including variations in teachers' digital competence, professional experience, and readiness for organizational change, contribute to unequal implementation outcomes among schools (Zulkarnaen et al., 2025). Collectively, these findings indicate that educational innovation cannot be successfully implemented through policy directives alone but requires equitable access to technological resources and continuous investment in institutional capacity development.

Another recurring challenge highlighted across the reviewed studies is the increasing workload experienced by teachers during innovation implementation. In addition to fulfilling instructional responsibilities, teachers are often expected to adopt new technologies, redesign learning materials, participate in professional development activities, and complete additional administrative tasks associated with educational reform (Petter et al., 2025). These cumulative demands may reduce the time available for experimentation, reflection, and continuous improvement, thereby limiting teachers' capacity to implement innovation effectively. The synthesis of the literature demonstrates that implementation barriers rarely occur in isolation; instead, resistance to change, inadequate infrastructure, unequal professional capacity, and excessive workload interact to create complex organizational constraints. Consequently, addressing these challenges requires comprehensive strategies that combine supportive leadership, sustained professional development, sufficient technological investment, and organizational policies that reduce implementation burdens. Such integrated support systems are essential for ensuring that educational innovation can be implemented effectively and sustained over time.

Integration of Top-Down and Bottom-Up Approaches in the Implementation of Educational Innovation

The synthesis of the reviewed literature demonstrates that neither the top-down nor the bottom-up approach is independently sufficient to ensure the successful implementation of educational innovation. Each approach possesses distinctive strengths that address different dimensions of organizational change. The top-down approach provides strategic direction through policy formulation, regulatory consistency, coordinated implementation, and institutional resource allocation, enabling educational reforms to be implemented systematically across schools (Derek et al., 2025). In contrast, the bottom-up approach strengthens innovation by encouraging teacher autonomy, stakeholder participation, contextual problem-solving, and collaborative decision-making, allowing schools to adapt innovations to their unique

educational environments (Amiruddin et al., 2025). Rather than representing competing implementation models, the literature increasingly positions both approaches as complementary strategies whose effectiveness depends on their ability to address both institutional requirements and local educational needs. This perspective reflects a growing recognition that sustainable educational innovation requires coordinated action across multiple organizational levels.

A recurring finding across the reviewed studies is that integrating centralized governance with participatory implementation produces more balanced and sustainable innovation outcomes. Educational policies developed at governmental or institutional levels provide strategic guidance and ensure the availability of financial, technological, and administrative support required for large-scale reform. At the same time, active participation by teachers and school communities enables these policies to be translated into classroom practices that are relevant to local conditions and student learning needs (Widad et al., 2025). Such integration creates reciprocal relationships in which policy direction informs implementation, while feedback from schools continuously refines innovation processes. Furthermore, managerial support strengthens the continuity of school-based innovations by providing institutional legitimacy, whereas teacher participation enhances acceptance, ownership, and commitment throughout implementation (Iaskyana et al., 2022). These findings suggest that educational innovation becomes more adaptive when strategic leadership is complemented by meaningful stakeholder engagement.

The overall findings indicate that successful educational innovation should be understood as a dynamic organizational process requiring continuous interaction between policy leadership and grassroots participation. Innovation is most likely to achieve long-term sustainability when school leaders establish clear strategic goals while simultaneously creating opportunities for teachers and educational staff to contribute to planning, implementation, evaluation, and continuous improvement (Hamzah & Aksir, 2025). This integrated implementation model also strengthens organizational learning by facilitating knowledge exchange between policymakers and practitioners, thereby reducing resistance to change and improving institutional responsiveness to emerging educational challenges. Consequently, the synthesis supports the argument that educational innovation is not determined solely by regulatory authority or individual creativity but by the effective alignment of governance structures, professional competence, organizational culture, and stakeholder collaboration. This integrated perspective provides a comprehensive framework that can guide policymakers, school leaders, and educators in designing more adaptive, participatory, and sustainable educational innovation strategies across diverse school contexts.

CONCLUSION

This study demonstrates that the effectiveness of educational innovation is determined not by the exclusive use of either top-down or bottom-up approaches, but by their strategic integration to balance policy direction with stakeholder participation. The review highlights that leadership, teacher competence, organizational culture, technological infrastructure, and policy support are critical enablers, while resistance to change and resource limitations remain persistent barriers. These findings contribute to the literature by offering a comprehensive synthesis and an integrated conceptual perspective on educational innovation implementation based on recent evidence from 2022–2026. Nevertheless, this

study is limited by its reliance on published literature and the variability of educational contexts across the reviewed studies, which may affect the generalizability of the findings. Future research should empirically validate the proposed integration model across different educational settings and examine its long-term impact on innovation sustainability and school improvement.

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