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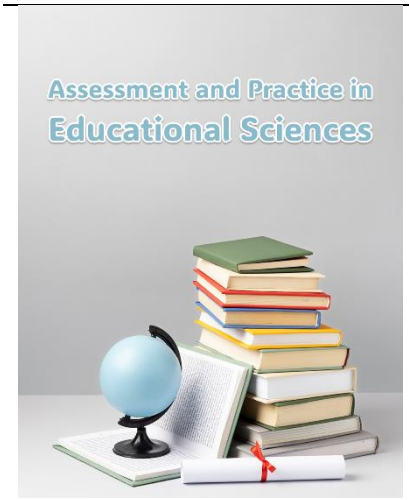

Identification of Factors Affecting the Enhancement of Practical Course Instruction Quality: A Systematic Review

ABSTRACT

The aim of the present study is to provide a systematic review of the literature related to the enhancement of the quality of practical course instruction, with a focus on identifying the key factors influencing it. The research question addressed in this article is: what are the factors affecting the improvement of the quality of practical course instruction at the secondary education level? The present study is descriptive in nature, applied in terms of purpose, and was conducted using a systematic review methodology. The analysis of theoretical literature was carried out in the Scopus database using keywords such as instructional improvement, course instruction quality, and practical course instruction quality within the time frame from 2000 to the end of 2024, resulting in the selection of 47 articles. The findings indicated that multiple factors—including a positive school climate and school culture, teacher effectiveness, strong leadership, technological resources and digital literacy, the flipped classroom approach, school efficiency, and demographic and social characteristics—play a role in enhancing the quality of practical course instruction at the secondary education level.

Keywords: Instructional quality, practical courses, secondary education, systematic review.

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Introduction

The quality of education has long been recognized as a central pillar in the development of human capital and the sustainability of educational systems, particularly within the context of rapidly evolving socio-economic and technological environments. In recent decades, educational policymakers and scholars have increasingly emphasized the importance of improving instructional quality as a means of enhancing student learning outcomes and institutional effectiveness (1, 2). Within

this broader discourse, the quality of practical course instruction has emerged as a critical domain, especially at the secondary education level, where students begin to translate theoretical knowledge into applied competencies. The effectiveness of such instructional practices is not only contingent upon pedagogical strategies but is also shaped by a complex interplay of organizational, individual, and contextual factors (3-5).

Educational quality is a multidimensional construct that encompasses various dimensions, including teaching effectiveness, curriculum relevance, learning environment, and student engagement. Early conceptualizations of educational effectiveness highlighted the role of structured teaching practices and classroom management in promoting academic achievement (5, 6). Over time, more dynamic and systemic models have been developed, emphasizing the interaction between school-level factors, teacher characteristics, and student background variables (4, 7). These models suggest that improving the quality of practical instruction requires a holistic approach that integrates instructional design, institutional leadership, and socio-cultural context.

One of the most influential determinants of instructional quality is teacher effectiveness, which has been consistently identified as a key predictor of student performance across educational settings. Research indicates that teachers' competencies, beliefs, and instructional practices significantly influence students' cognitive and non-cognitive outcomes (8-10). Effective teachers are characterized by their ability to adapt instructional methods to diverse learning needs, foster student engagement, and create supportive learning environments. Moreover, teacher motivation and professional development play a crucial role in enhancing instructional quality, as motivated educators are more likely to adopt innovative pedagogical approaches and continuously improve their teaching practices (11, 12).

In addition to teacher-related factors, school leadership and organizational climate have been identified as critical determinants of educational quality. Leadership practices that promote collaboration, accountability, and continuous improvement can significantly enhance teacher performance and student outcomes (13, 14). School leaders play a pivotal role in shaping institutional culture, allocating resources, and implementing policies that support effective teaching and learning. A positive school climate characterized by trust, mutual respect, and shared goals has been shown to foster student engagement and academic achievement (15, 16). Conversely, negative organizational conditions, such as organizational cynicism, can undermine school effectiveness and hinder educational improvement efforts (17).

The integration of technology into educational processes has further transformed the landscape of instructional quality, particularly in practical courses where experiential learning is essential. Digital resources and innovative teaching methods, such as the flipped classroom model, have been widely adopted to enhance student engagement and facilitate active learning (18, 19). The effectiveness of these approaches depends on the availability of technological infrastructure, teachers' digital literacy, and institutional support (20, 21). While technology offers significant opportunities for improving instructional quality, it also presents challenges related to accessibility, efficiency, and resource allocation, particularly in online and distance learning environments (22, 23).

Another important dimension of educational quality is the learning environment, which encompasses both physical and psychological aspects of the educational setting. A safe and supportive learning environment has been shown to enhance student motivation, engagement, and academic performance (24, 25). School culture, defined as the shared values, beliefs, and practices within an institution, plays a crucial role in shaping students' learning experiences and outcomes (26, 27). Furthermore, the sense of belonging among students has been identified as a key factor influencing academic success, particularly in diverse and socio-economically heterogeneous educational contexts (28).

Socio-demographic factors also contribute significantly to variations in educational quality and student achievement. Studies have demonstrated that students' socio-economic status, parental involvement, and community context influence both access to educational resources and learning outcomes (29-31). Additionally, disparities in educational opportunities related to

geographic location and institutional characteristics can affect students' academic trajectories and long-term success (32). These findings underscore the importance of addressing equity and inclusion in efforts to improve the quality of practical course instruction.

From a managerial perspective, the efficiency and effectiveness of educational institutions are closely linked to their ability to optimize resources and implement evidence-based practices. Studies employing data envelopment analysis and other quantitative methods have highlighted the importance of managerial practices in enhancing school efficiency and performance (33, 34). Effective governance structures and quality management frameworks can facilitate continuous improvement and ensure alignment between institutional goals and educational outcomes (35, 36). Moreover, financial and moral incentives have been identified as key drivers of organizational performance in educational settings (37).

Recent research has also emphasized the role of innovative pedagogical approaches in improving instructional quality. Models such as problem-based learning, differentiated instruction, and creative problem-solving have been shown to enhance students' higher-order thinking skills and engagement (38). Similarly, computational and data-driven approaches to pedagogy have provided new insights into the factors influencing teaching quality and student performance (39). These approaches enable educators to tailor instruction to individual learning needs and monitor student progress more effectively.

The evaluation and assessment of educational quality have also evolved significantly, with increasing emphasis on competency-based approaches and performance-based assessments. Quality assurance mechanisms, including standardized testing and accreditation processes, play a crucial role in monitoring and improving educational outcomes (40, 41). Large-scale assessments and international benchmarking studies have provided valuable data for identifying best practices and informing policy decisions (42). However, the effectiveness of these measures depends on their alignment with instructional goals and their ability to capture the complexity of learning processes.

Despite the extensive body of research on educational quality, there remains a need for comprehensive and systematic analyses that integrate findings from diverse contexts and disciplines. Previous studies have often focused on specific factors or educational levels, limiting their generalizability and applicability to practical course instruction at the secondary level. A systematic review approach allows for the synthesis of existing evidence and the identification of key factors that influence instructional quality across different contexts (43, 44). Such an approach provides a more holistic understanding of the determinants of educational quality and supports the development of evidence-based strategies for improvement.

Furthermore, the growing complexity of educational systems and the increasing demands placed on students and educators necessitate a more integrated and interdisciplinary approach to improving instructional quality. The interplay between individual, organizational, and contextual factors requires a comprehensive framework that considers the dynamic nature of educational processes (45, 46). By identifying and analyzing the key factors influencing the quality of practical course instruction, this study aims to contribute to the development of more effective and sustainable educational practices.

In light of these considerations, the aim of this study is to systematically identify and analyze the factors affecting the enhancement of the quality of practical course instruction at the secondary education level.

Methods and Materials

The objective of the present study is to conduct an in-depth analysis of existing literature on enhancing the quality of practical course instruction. In accordance with the literature review protocol, a step-by-step methodological approach was employed to ensure that the collected and analyzed data are accurate, reliable, and practically applicable. From this perspective, the review of existing literature involves the screening and selection of information sources to ensure the validity and credibility of the interpreted and presented data. This process is structured into three phases and six steps (see Table 1).

Table 1.Systematic Process of Literature Review

Phase	Step	Description
Exploration	First	Formulation of the research problem
Exploration	Second	Search for relevant theoretical literature
Exploration	Third	Critical evaluation of selected studies
Exploration	Fourth	Synthesis of diverse sources
Interpretation	Fifth	Analysis of findings and provision of recommendations
Communication	Sixth	Presentation of the final report

The methodological approach began with a literature search in the Scopus indexing database, which is considered one of the most significant online platforms for scientific publications. The keyword “instructional improvement” was used to identify potential sources in the initial search phase, resulting in the identification of 130,281 related documents. In the subsequent stage, the keyword “enhancement of instructional quality” yielded 352 documents. Further refinement was conducted by applying inclusion criteria within the subject area of educational management up to the end of 2024, ultimately leading to 47 documents included in the final report. Table 2 presents the screening methodology used to obtain the final set of sources.

Table 2. Research Screening Methodology

Database: SCOPUS	Screening Stage	Number of Documents
Meta-search	Keyword: Instructional Improvement	130,281
Inclusion Criteria	Keyword: Quality of Course Instruction	352
Inclusion Criteria	Exact Keyword: Quality of Practical Course Instruction	47
Subject Area	Educational Management	—
Screening Period	From 2000 to the end of 2024	—

Findings and Results

The review of the literature on improving the quality of practical course instruction led to the identification of a set of recurring and analytically meaningful themes. The purpose of this section is to present the key findings extracted from the selected studies and to organize them into major categories of factors associated with the enhancement of instructional quality in practical courses. Across the reviewed literature, several variables appeared repeatedly as statistically or conceptually significant predictors of improved educational quality, including positive school climate and school culture, teacher effectiveness, strong leadership, technological resources and digital literacy, flipped classroom practices, school efficiency, and socio-demographic characteristics. These findings indicate that the improvement of practical course instruction is not determined by a single variable, but rather by the combined effect of instructional, organizational, technological, and contextual conditions (39, 43, 44, 47).

Table 3. Summary of Findings on Factors Affecting the Enhancement of Practical Course Instruction Quality

Theme	Core finding	Representative sources
Positive school climate and school culture	A supportive, collaborative, and respectful school environment strengthens teacher commitment, school effectiveness, and instructional quality.	(15, 16, 24, 26, 27, 43)
Teacher effectiveness	Teacher competence, motivation, experience, interaction quality, and participation in school decisions are major contributors to better learning quality.	(8, 9, 11, 12, 25, 48)
Strong leadership	Instructional and participatory leadership improves teacher performance, collaboration, and the overall effectiveness of educational processes.	(13, 14, 49-51)
Technological resources and digital literacy	Access to digital tools, teacher digital competence, and institutional support increase the effectiveness of online and blended practical instruction.	(20-23, 42)
Flipped classroom	The flipped model increases engagement and supports active learning, although its effects vary across student groups and implementation contexts.	(18, 19, 52)

School efficiency	Financial resources, staffing, infrastructure, and efficient input-output management are linked to stronger instructional outcomes.	(33-36, 53)
Socio-demographic characteristics	Socio-economic status, migration background, parental involvement, and contextual inequalities influence educational opportunities and instructional outcomes.	(7, 28-32)

The first major finding concerns the role of positive school climate and school culture in improving the quality of practical course instruction. The reviewed studies consistently show that a constructive organizational atmosphere enhances teacher commitment, coordination, and instructional effectiveness. A positive school climate is not merely an environmental condition; rather, it functions as an enabling mechanism through which teachers, administrators, and students engage more effectively in the teaching-learning process. Research has shown that supportive school environments are associated with stronger academic achievement and healthier patterns of school participation (15). In parallel, school culture has been identified as a powerful predictor of school effectiveness, particularly when it values professional development, collaboration, participatory leadership, and teamwork (26, 43). Additional evidence indicates that high-performing schools tend to exhibit stronger cultural coherence and stronger leadership-related values than low-performing schools (27). The importance of safe and supportive learning environments has also been emphasized as a foundation for sustained educational quality (24).

The second major finding is that teacher effectiveness remains one of the most influential factors in improving the quality of practical course instruction. The reviewed literature demonstrates that teacher-related variables such as pedagogical competence, professional beliefs, years of experience, motivation, and interaction quality have a direct association with student achievement and learning quality. Meta-analytic evidence confirms that teacher characteristics and competencies significantly affect academic performance (8). Studies further indicate that effective teachers contribute to a positive learning climate, collaborate with colleagues, and use student-related evidence to refine instruction (12). The quality and consistency of teacher-student interactions were also found to be crucial, especially because they influence student engagement, motivation, and performance in school (25). Moreover, motivational conditions such as fair organizational systems, teamwork, and positive supervisory approaches are important for strengthening teacher commitment and performance (11). Findings also suggest that contextual predictors such as student gender and linguistic identity do not always significantly explain differences in teacher effectiveness, which highlights the centrality of professional practice itself (9).

The third finding concerns the importance of strong leadership in enhancing the quality of practical course instruction. The literature indicates that instructional leadership, school leadership, and participatory leadership all contribute to more effective schools and higher-quality teaching. Strong leadership supports teacher development, promotes shared goals, and creates an organizational structure in which instructional improvement becomes sustainable. Evidence from educational leadership studies shows that school heads' leadership practices are significantly associated with teacher performance and institutional effectiveness (13). Similarly, the relationship between deputy principals' instructional leadership and school effectiveness has been shown to remain significant across school levels (14). Leadership also supports professional development processes and affects the success of teacher learning and instructional change (49). Findings from school improvement research further indicate that effective schools are shaped by multiple process factors, including effective leadership, effective teaching, monitoring of progress, staff skill development, and parental involvement (50, 51). Taken together, these studies suggest that the improvement of practical instruction requires leadership that is not only administratively competent but also pedagogically focused and relationally supportive.

The fourth finding highlights the role of technological resources and digital literacy in improving instructional quality. A substantial proportion of the reviewed studies addressed digital learning conditions, especially because part of the review period overlapped with the COVID-19 pandemic and the rapid expansion of online education. These studies indicate that the use of

digital resources can enhance student motivation, instructional flexibility, and access to learning opportunities, particularly when teachers are adequately trained and supported. Research has shown that digital resources can contribute positively to students' development and classroom learning processes (20). At the same time, online and distance education introduced challenges related to access, inconvenience, scarcity of resources, and uneven technological preparedness (22, 23). Evidence from pandemic-era teaching also suggests that teachers with stronger prior experience in technology integration were better able to transition to online instruction and maintain instructional quality (21). Large-scale educational analyses further emphasize that equitable and effective school practices increasingly depend on the strategic use of data and digital learning tools (42). Thus, digital literacy and technological infrastructure should be seen not as supplementary factors but as integral components of practical course quality in contemporary education.

The fifth finding concerns the flipped classroom as an instructional approach that may support the improvement of practical course instruction. The reviewed studies indicate that the flipped classroom has gained prominence as a form of active and student-centered learning in which direct instruction is shifted outside the classroom and in-class time is used for interaction, practice, and application. In comparison with conventional teaching, this model tends to promote greater student engagement and encourages active participation in the learning process. Empirical studies show that the flipped classroom can improve academic performance and strengthen the effectiveness of student learning experiences (18, 19). It has also been reported to influence teachers' instructional practices and beliefs in constructive ways when implementation is appropriately supported (52). At the same time, the findings suggest that the benefits of this model are not uniformly distributed across all student groups and may depend on students' self-regulation, home learning conditions, and readiness for independent study. Therefore, while the flipped classroom appears to be a promising strategy for practical instruction, its success depends on careful design, adequate digital support, and alignment with student needs.

The sixth finding relates to school efficiency as an important structural condition for improving the quality of practical course instruction. School efficiency refers to the capacity of educational institutions to make optimal use of their inputs, including financial resources, staff, and physical infrastructure, in order to achieve desired educational outputs. The reviewed literature shows that efficient schools are generally better positioned to provide consistent and high-quality instruction, including in practical subjects that often require specialized materials, spaces, and logistical coordination. Comparative analyses based on educational efficiency models demonstrate that managerial practices significantly affect school productivity and effectiveness (33, 34). Studies on technical efficiency in schools further suggest that working conditions, teacher workload, and institutional organization influence educational outputs and instructional quality (53). Governance quality also matters, as schools with stronger governance arrangements tend to show better performance and greater institutional coherence (36). From a management perspective, these findings are consistent with quality management principles emphasizing optimal use of resources, continuous improvement, and organizational excellence (35).

The seventh and final finding concerns socio-demographic characteristics as contextual variables influencing the quality of practical course instruction. The reviewed studies indicate that social and demographic conditions shape the resources, opportunities, and constraints that affect students' participation and achievement. Variables such as socio-economic status, parental involvement, migration background, and broader contextual inequalities have all been linked to differential educational outcomes. Meta-analytic evidence has long shown that parental involvement positively affects academic achievement (29), while more recent quantitative studies confirm that family engagement remains an important predictor of student success (30). Research also indicates that socio-economic segregation and unequal access to school resources negatively affect academic performance and school behaviors (7). At the same time, the relationship between socio-economic disadvantage and school quality is not entirely linear, since some high-poverty contexts may also generate strong forms of social motivation and

educational aspiration (32). Additional evidence suggests that students' sense of belonging and socio-economic background are interrelated and can shape how they experience educational settings (28). These findings indicate that socio-demographic conditions must be treated as integral contextual determinants in any effort to improve the quality of practical course instruction (31).

Discussion and Conclusion

The findings of the present study revealed that the quality of practical course instruction at the secondary education level is influenced by a multidimensional set of factors, including school climate and culture, teacher effectiveness, leadership practices, technological resources and digital literacy, instructional innovations such as the flipped classroom, institutional efficiency, and socio-demographic characteristics. These findings align with the broader theoretical and empirical literature on educational effectiveness, which conceptualizes instructional quality as an outcome of the interaction between contextual, organizational, and individual variables (4, 44). The identification of these factors through a systematic review underscores the complexity of improving practical instruction and highlights the need for integrated strategies that address multiple dimensions simultaneously.

One of the central findings of this study is the critical role of teacher effectiveness in enhancing instructional quality. The reviewed literature consistently emphasizes that teachers' competencies, beliefs, and instructional behaviors significantly influence student learning outcomes, particularly in practical and skill-based courses. This is supported by meta-analytic evidence demonstrating that teacher characteristics and pedagogical competencies are among the strongest predictors of academic achievement (8). Furthermore, studies indicate that teachers' beliefs about teaching and learning shape their instructional practices and, consequently, student performance (10, 12). The present findings also resonate with research highlighting the importance of adaptive teaching strategies and the ability to engage students actively in the learning process (9, 48). In the context of practical courses, where experiential and hands-on learning are essential, the role of the teacher becomes even more pronounced, requiring not only subject expertise but also pedagogical flexibility and innovation (54).

Another significant factor identified in this study is the influence of school leadership and organizational practices on instructional quality. The findings indicate that strong and effective leadership contributes to the creation of a supportive environment that fosters teacher performance and student engagement. This is consistent with previous research demonstrating that instructional leadership is a key determinant of school effectiveness and teacher productivity (13, 14). Leadership practices that promote collaboration, professional development, and accountability have been shown to enhance the overall quality of teaching and learning processes (49). Moreover, governance structures that emphasize transparency, participation, and continuous improvement are associated with higher levels of institutional performance and educational outcomes (36). These findings suggest that improving practical course instruction requires not only individual teacher efforts but also systemic changes at the organizational level.

The study also highlights the importance of school climate and culture as key determinants of instructional quality. A positive school climate characterized by trust, safety, and mutual respect has been shown to enhance student motivation, engagement, and academic performance (15, 24). Similarly, a strong and supportive school culture fosters a sense of belonging among students and teachers, which in turn contributes to improved learning outcomes (26, 28). The findings of this study are further supported by research indicating that organizational climate influences teacher commitment and job satisfaction, which are critical for maintaining high-quality instruction (16, 55). Conversely, negative organizational conditions, such as cynicism and lack of support, can undermine school effectiveness and hinder efforts to improve instructional quality (17).

Technological resources and digital literacy emerged as another crucial factor influencing the quality of practical course instruction. The integration of digital tools and platforms into teaching and learning processes has been shown to enhance student engagement and facilitate active learning, particularly in practical and applied subjects. Studies indicate that the effective use of digital resources can significantly improve students' learning experiences and outcomes (20). Furthermore, innovative instructional models such as the flipped classroom have been identified as effective strategies for promoting active and student-centered learning (18, 19). However, the effectiveness of these approaches depends on the availability of technological infrastructure and the digital competencies of teachers and students (21). The challenges associated with online and distance learning, including issues of access and efficiency, further highlight the need for comprehensive strategies to support digital integration in education (22, 23).

Institutional efficiency and managerial practices also play a significant role in shaping instructional quality. The findings of this study indicate that efficient resource allocation and effective management practices are essential for creating an environment conducive to high-quality teaching and learning. This is consistent with research demonstrating that managerial practices, including strategic planning and performance monitoring, are closely linked to school efficiency and student outcomes (33, 34). Additionally, the application of quality management principles in educational institutions has been shown to enhance organizational performance and support continuous improvement efforts (35). The importance of financial and non-financial incentives in motivating teachers and improving institutional efficiency further underscores the role of management in enhancing instructional quality (37).

Socio-demographic factors, including students' socio-economic status, parental involvement, and community context, were also identified as significant determinants of instructional quality. The findings suggest that disparities in access to educational resources and opportunities can significantly influence students' learning outcomes, particularly in practical courses that require specialized equipment and materials. This is supported by research demonstrating that parental involvement and socio-economic factors play a crucial role in shaping students' academic performance (29, 30). Furthermore, studies indicate that socio-economic and demographic characteristics influence students' engagement, motivation, and overall educational experiences (7, 31). These findings highlight the importance of addressing equity and inclusion in efforts to improve the quality of practical course instruction.

The findings of this study also emphasize the role of innovative pedagogical approaches in enhancing instructional quality. Approaches such as differentiated instruction, problem-solving-based learning, and creative thinking strategies have been shown to improve students' cognitive and practical skills (38). Additionally, computational and data-driven approaches to pedagogy provide valuable insights into the factors influencing teaching effectiveness and student performance (39). The integration of these approaches into practical course instruction can enhance students' ability to apply theoretical knowledge in real-world contexts and develop critical thinking skills.

Moreover, the evaluation and assessment of educational quality were identified as important components of instructional improvement. The findings suggest that competency-based assessment and performance evaluation play a crucial role in monitoring and enhancing instructional quality. This is consistent with research highlighting the importance of quality assurance mechanisms in education (40). Large-scale assessments and benchmarking studies provide valuable data for identifying best practices and informing policy decisions (42). However, the effectiveness of these measures depends on their alignment with instructional goals and their ability to capture the complexity of learning processes (41).

Finally, the findings of this study highlight the importance of a holistic and integrated approach to improving the quality of practical course instruction. The interplay between teacher effectiveness, leadership practices, school climate, technological resources, and socio-demographic factors suggests that isolated interventions are unlikely to produce sustainable

improvements. Instead, comprehensive strategies that address multiple dimensions of instructional quality are required. This perspective is supported by research emphasizing the dynamic and interconnected nature of educational systems (43). Furthermore, the alignment of institutional goals, teaching practices, and student needs is essential for achieving high-quality educational outcomes (45, 46).

The present study contributes to the existing body of knowledge by providing a systematic and comprehensive analysis of the factors influencing the quality of practical course instruction at the secondary education level. By synthesizing findings from diverse contexts and disciplines, this study offers valuable insights for educators, policymakers, and researchers seeking to enhance instructional quality and improve student outcomes.

One limitation of the present study is that it relies exclusively on published literature indexed in a single database, which may limit the comprehensiveness of the findings and exclude relevant studies from other databases or gray literature sources. Additionally, the inclusion criteria restricted the analysis to studies within a specific time frame and subject area, potentially overlooking important contextual variations and emerging trends. Another limitation relates to the heterogeneity of the reviewed studies in terms of methodology, sample characteristics, and educational contexts, which may affect the generalizability of the findings.

Future research should aim to expand the scope of systematic reviews by incorporating multiple databases and including a broader range of study designs and contexts. Longitudinal and experimental studies are needed to establish causal relationships between the identified factors and instructional quality. Additionally, further research should explore the interaction effects between different variables, such as the combined impact of teacher effectiveness and technological integration on student outcomes. Comparative studies across different educational systems and cultural contexts would also provide valuable insights into the generalizability of the findings.

From a practical perspective, the findings of this study suggest that policymakers and educational leaders should adopt a comprehensive and evidence-based approach to improving the quality of practical course instruction. This includes investing in teacher professional development, enhancing school leadership capacities, and fostering a positive and inclusive school climate. Additionally, efforts should be made to integrate technology effectively into teaching and learning processes and to ensure equitable access to educational resources. Schools should also implement robust quality assurance mechanisms and continuously monitor and evaluate instructional practices to support ongoing improvement.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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