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Education in Crisis: A Systematic Review of Teaching and Learning in the COVID-19 Era

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Abstract

The COVID-19 pandemic has profoundly disrupted education systems worldwide, necessitating a rapid shift to remote learning and exposing both challenges and opportunities within teaching and learning practices. Guided by Bandura's Social Cognitive Theory, which emphasizes the interplay between personal, behavioural, and environmental factors in learning this systematic review aims to synthesize the existing literature on the impact of the pandemic on education, focusing on the multifaceted challenges faced by educators and students, as well as the emergent opportunities for innovation and improvement. Key challenges identified include technological disparities, diminished student engagement, and increased stress among educators and learners. Concurrently, the pandemic has catalysed advancements in educational technology, fostered greater flexibility in teaching methodologies, and highlighted the importance of social-emotional learning. A comprehensive search of multiple academic databases was conducted, followed by rigorous screening based on predefined inclusion and exclusion criteria, quality appraisal of selected studies, and thematic synthesis of findings, in alignment with PRISMA guidelines, to ensure transparency and methodological rigor. By examining these dimensions, this review provides a comprehensive understanding of the pandemic's educational implications and offers insights into strategies for enhancing resilience and effectiveness in future educational disruptions. The findings underscore the need for equitable access to technology, support for mental health, and the integration of adaptive pedagogical approaches to create a more robust and inclusive education system. These insights extend beyond the COVID-19 context, offering guidance for educational preparedness and responsiveness in future global crises.

Keywords: COVID-19; learning opportunities, remote learning; teaching challenges;; technological disparities

Introduction

The COVID-19 pandemic, which emerged in late 2019, rapidly escalated into a global health crisis with far-reaching effects on every aspect of society. Among the most profoundly affected sectors was education, with the pandemic necessitating an abrupt shift from traditional in-person learning to various forms of remote and online instruction. This unprecedented disruption exposed both longstanding and new challenges within educational systems worldwide, while also highlighting significant opportunities for innovation and reform (Wills & van der Berg, 2024). Framing this study within Bandura's Social Cognitive Theory provides a lens to understand how personal factors (e.g., motivation, self-efficacy), behavioral factors (e.g., engagement strategies, teaching practices), and environmental factors (e.g., digital access, policy context) interacted to shape educational experiences during the pandemic (Bandura, 1986; Schunk & DiBenedetto, 2020). The closure of schools and universities as a measure to contain the spread of COVID-19 led to an immediate and often chaotic transition to remote learning. This shift brought to light significant disparities in access to technology and the internet, as well as varying levels of digital literacy among students and educators (van de Werfhorst, Kessenich & Geven, 2022). These

technological challenges were particularly pronounced in under-resourced regions and among marginalized communities, exacerbating existing educational inequities.

Simultaneously, educators faced the dual challenges of adapting to new teaching modalities and managing increased workloads and stress levels (Sia et al., 2023). The rapid adoption of digital tools and platforms required significant upskilling, while maintaining student engagement and managing the social-emotional aspects of learning posed additional hurdles. From a Social Cognitive Theory perspective, such adaptation required educators and students to engage in reciprocal determinism—adjusting their behaviors and cognitive strategies in response to changing environmental demands, while also shaping the learning environment through innovative practices (Bandura, 2001). Despite these challenges, the crisis also acted as a catalyst for educational innovation, encouraging the exploration of new pedagogical approaches and the integration of technology in ways that may have long-lasting benefits (Ahmed & Opoku, 2022). This systematic review aims to provide a comprehensive examination of the challenges and opportunities associated with teaching and learning during the COVID-19 pandemic. By synthesizing findings from a wide range of studies, this review seeks to offer a nuanced understanding of the pandemic's impact on education.

Understanding both the challenges and opportunities that have arisen during the COVID-19 pandemic is essential for shaping future educational policies and practices. Using Bandura's framework also allows for deeper insight into how self-efficacy beliefs and observational learning influenced both teaching and learning adaptations, particularly in the adoption of new technologies and the integration of social-emotional learning. This systematic review aims to provide educators, policymakers, and researchers with evidence-based insights to enhance the resilience and adaptability of education systems. By identifying effective strategies and highlighting areas requiring further support, the study contributes to the ongoing efforts to build a more equitable and robust educational framework capable of withstanding future disruptions. Through this systematic review, I aim to illuminate the complex landscape of education during the COVID-19 pandemic, providing a foundation for future research and the development of strategies to enhance educational equity and resilience in times of crisis.

The Emergence of the COVID-19 Pandemic

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, first emerged in Wuhan, China, in late 2019. What initially appeared to be a localized outbreak of pneumonia soon escalated into a global health crisis. The virus's high transmissibility and the lack of prior immunity in the human population facilitated its rapid spread across continents, leading to widespread illness, significant mortality, and profound societal disruptions. By early 2020, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern, and shortly thereafter, a global pandemic (Cucinotta & Vanelli, 2020). Governments worldwide implemented drastic measures to curb the virus's spread, including lockdowns, social distancing mandates, and the closure of public spaces (Ayouni et al., 2021). One of the most impactful decisions was the closure of educational institutions, affecting billions of students and educators.

The sudden closure of schools and universities necessitated an immediate and unplanned transition to remote learning. This shift was marked by several key challenges. Not all students had access to the necessary devices or reliable internet connections, exacerbating educational inequities. In many regions, students from low-income families, rural areas, and underfunded schools faced significant barriers to participating in online learning (Alivernini et al., 2023). Both students and educators had varying levels of proficiency with digital tools and platforms, leading to a steep learning curve. The need for rapid upskilling placed additional stress on educators, who had to adapt their teaching methods while continuing to engage students effectively. Maintaining student engagement in a remote learning environment proved challenging (Tulaskar & Turunen, 2022). The lack of physical

presence, coupled with the distractions of home environments, often led to reduced motivation and participation among students (Brachtl et al., 2023). The pandemic also had a significant impact on the mental health and well-being of both students and educators (Penninx et al., 2022). The isolation, uncertainty, and stress associated with the crisis contributed to increased levels of anxiety and depression, further complicating the educational experience.

Despite these challenges, the COVID-19 pandemic also presented opportunities for innovation and reform in education. The widespread adoption of digital tools and platforms accelerated the integration of technology in education (Haleem et al., 2022). This shift has the potential to enhance personalized learning, provide flexible learning opportunities, and support differentiated instruction. Educators experimented with various teaching methods, including flipped classrooms, blended learning, and project-based learning. These approaches often emphasized student-centred learning and active engagement. The pandemic underscored the importance of social-emotional learning (SEL), leading to a greater emphasis on students' and educators' mental health and well-being. Integrating SEL into the curriculum has become a priority, fostering a more holistic approach to education. The crisis highlighted the need for education systems to be resilient and adaptable. Lessons learned during the pandemic are informing the development of more flexible and inclusive educational models that can better withstand future disruptions.

This systematic review aims to synthesize the existing literature on the impact of the COVID-19 pandemic on education, focusing on both the challenges and opportunities that have emerged. By examining diverse contexts and educational levels, the study seeks to provide a comprehensive understanding of the pandemic's implications for teaching and learning. The review addresses critical questions regarding technological disparities, innovative practices, social-emotional learning, and strategies for enhancing educational resilience. By offering evidence-based insights, this study aims to inform policymakers, educators, and researchers as they work towards creating a more equitable, robust, and adaptable education system capable of meeting the needs of all learners in times of crisis.

Research problem

The COVID-19 pandemic has led to an unprecedented disruption in the global education system, necessitating a rapid and often unplanned transition to remote and online learning. This shift has exposed and exacerbated existing inequities, posed significant challenges to effective teaching and learning, and placed considerable stress on students and educators (Barrot, Llenares & del Rosario, 2021). At the same time, the crisis has acted as a catalyst for educational innovation, encouraging the adoption of new technologies and pedagogical approaches. However, there is a need for a comprehensive understanding of these challenges and opportunities to inform future educational practices and policies (Engelbrecht, 2020). While the pandemic's impacts have been global, the nature and extent of challenges such as technological disparities, engagement issues, and access to innovative practices have varied considerably across geographical, socio-economic, and infrastructural contexts. In some regions, robust digital infrastructure and policy readiness mitigated the effects of school closures, whereas in others, limited connectivity and resources significantly deepened educational inequities. The central research problem of this study is to systematically review and synthesize the existing literature on the impact of the COVID-19 pandemic on education, with a focus on identifying and analysing the challenges and opportunities associated with teaching and learning during this period. This includes examining technological disparities, engagement issues, mental health concerns, and the innovative practices that have emerged in response to the crisis. By situating these findings within diverse global contexts, the study aims to provide evidence-based insights that can help build a more resilient, equitable, and effective education system capable of withstanding future disruptions.

Rationale for Conducting the Systematic Review

The COVID-19 pandemic has caused a seismic shift in education worldwide, forcing a swift transition from traditional in-person

instruction to remote and online learning modalities. This sudden change has revealed significant challenges and opportunities within the educational landscape, necessitating a thorough examination to inform future practices and policies (Oyedotun, 2020). Conducting a systematic literature review on this topic is crucial for several reasons. The pandemic has had a profound effect on all levels of education, from primary schools to universities (Pokhrel & Chhetri, 2021). By systematically reviewing the literature, we can gain a comprehensive understanding of how different educational contexts have been affected, identifying common challenges and unique experiences.

The shift to remote learning has highlighted and, in many cases, exacerbated existing inequities in access to technology, internet connectivity, and digital literacy (Livingston et al., 2023). A systematic review will help to document these disparities and provide evidence-based recommendations for addressing them, ensuring that all students can succeed. Policymakers and educators need reliable data and insights to make informed decisions about how to support students and teachers during and after the pandemic. This review synthesizes current research findings, offering a solid foundation for developing effective policies and practices that enhance educational resilience and equity. The pandemic has driven significant innovation in educational technology and pedagogical approaches (Christopoulos, Sprangers & Wang, 2021). By examining these developments, the review can identify successful strategies and tools that can be integrated into mainstream education to improve learning outcomes and engagement. The crisis has taken a toll on the mental health and well-being of both students and educators (Liu et al., 2021). Understanding the social-emotional challenges and effective interventions documented in the literature will be crucial for creating supportive educational environments that prioritize mental health. The pandemic has underscored the need for adaptable and resilient education systems that can withstand future disruptions. This review will provide insights into how education systems can be better prepared for emergencies, fostering long-term sustainability and stability.

While numerous studies have been conducted on various aspects of education during the COVID-19 pandemic, there is a need to consolidate this knowledge to identify gaps and areas for future research (Imran et al., 2023). This systematic review contributes to the academic literature by synthesizing existing studies and highlighting critical areas for ongoing investigation. By conducting this systematic literature review, the study aims to provide a comprehensive, evidence-based analysis of the pandemic's impact on education. This will support the development of more equitable, effective, and resilient educational practices and policies, ultimately contributing to the improvement of education systems worldwide.

Objectives of the systematic review

The study aims to achieve the following objectives:

- To systematically identify and analyse the primary challenges encountered by educators and students during the transition to remote learning due to the COVID-19 pandemic, focusing on technological disparities, engagement issues, and increased workloads.
- To investigate the extent to which the pandemic exacerbated existing educational inequities, particularly in access to technology and internet connectivity, and to assess the impact of these inequities on student learning outcomes and engagement.
- To document and evaluate innovative teaching and learning practices that emerged during the pandemic, such as the use of digital tools, blended learning approaches, and new pedagogical methods, and to assess their effectiveness in improving educational outcomes.
- To examine the role and effectiveness of social-emotional learning (SEL) interventions implemented during the pandemic to support the mental health and well-being of students and educators, and

to identify best practices for integrating SEL into the curriculum.

- To synthesize the key lessons learned from the educational responses to the COVID-19 pandemic, providing evidence-based recommendations for policymakers and educators aimed at building more resilient, equitable, and adaptable education systems for future crises.

By achieving these objectives, the study seeks to provide a comprehensive understanding of the multifaceted impact of the COVID-19 pandemic on education, offering valuable insights for enhancing the quality and equity of education in a post-pandemic world.

Methods

This study adopted a systematic review methodology to ensure a comprehensive and rigorous synthesis of relevant literature on teaching and learning during the COVID-19 pandemic. The process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) to maintain transparency and replicability. The following steps were undertaken:

Defining the Review Scope and Objectives: The review focused on the challenges and opportunities in teaching and learning during the COVID-19 pandemic, guided by clearly articulated research questions. The review covered empirical and review studies published between January 2022 and April 2024 to capture research conducted after the initial emergency transition phase, thereby reflecting more stabilised adaptations in educational practice.

Developing a Protocol: A systematic review protocol was developed in line with the PRISMA 2020 guidelines (Page et al., 2021). The protocol outlined search strategies, inclusion and exclusion criteria, data extraction processes, and quality assessment tools. The protocol was registered with PROSPERO to enhance transparency and reproducibility.

Literature Search: A comprehensive literature search was conducted covering the period January 2022 to December 2024. This time frame was selected to ensure inclusion of research reflecting the pandemic's mid-to-late stages and its evolving educational implications. Databases searched included:

- ERIC – selected for its comprehensive coverage of education-focused peer-reviewed literature.
- Web of Science & Scopus – chosen for multidisciplinary coverage and citation tracking.
- Google Scholar – used to identify grey literature and recent publications not yet indexed in other databases.

The search used Boolean operators and truncations combining keywords such as: *"COVID-19" AND "education"*, *"remote learning challenges"*, *"digital learning opportunities"*, *"educational equity"*, *"online teaching strategies"*.

Screening and Selection: Screened search results based on predefined inclusion and exclusion criteria. Studies were included if they focus on the impact of the COVID-19 pandemic on education, address challenges and/or opportunities in teaching and learning, are published in peer-reviewed journals or reputable academic sources, and excluded studies that were not in English, non-peer-reviewed, or focused on other aspects of the pandemic not related to education.

Data Extraction: Extracted relevant data from the selected studies using a standardized data extraction form. Key information extracted included study characteristics (e.g., authors, publication year, study design), population details (e.g., age group, educational level), intervention or focus of the study (e.g., remote learning strategies, SEL practices), key findings related to challenges and opportunities as well as outcomes measured and their impact on education

Quality Assessment: Assessed the quality and risk of bias of the included studies using appropriate tools, such as the Newcastle-Ottawa Scale Ga, (2000)for observational studies and the Cochrane Risk of Bias Tool for randomized

controlled trials Higgins, Savović, Page, & Sterne, (2019). This helped to ensure the reliability and validity of the findings.

Data Synthesis: Synthesized the extracted data using qualitative and/or quantitative methods, depending on the nature of the studies. For qualitative data, thematic analysis was employed to identify common themes and patterns. For quantitative data, meta-analysis was conducted if the data were sufficiently homogeneous.

Interpretation and Discussion: Interpreted the synthesized findings in the context of the research questions and objectives. Discussed the implications of the challenges and opportunities identified, and their relevance to future educational practices and policies.

Reporting: Prepared a comprehensive report of the systematic review, including methodology, results, discussion, and conclusions. Followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency and completeness in reporting.

Review and Update: Planned for periodic reviews and updates of the literature to incorporate new research findings and maintain the relevance of the review.

Limitations: Potential limitations of this study include the restriction to English-language publications, which may have excluded relevant research published in other languages; the exclusion of non-peer-reviewed work, which could have omitted timely but unpublished innovations.

By following this methodology, the study aimed to provide a thorough and systematic examination of the challenges and opportunities in teaching and learning during the COVID-19 pandemic, offering valuable insights for stakeholders in the education sector.

Results

Table 1 provides a summary of key studies reviewed in the research. Each row of the table details findings from different studies, categorizing them by study design, population, key findings, identified challenges, and identified opportunities. An explanation of the table is provided below.

Study Design: This column indicates the methodological approach used in each study (Qualitative, Quantitative, Mixed Methods, Systematic Review).

Population: This column specifies the demographic or educational level of the participants involved in each study, such as secondary students, university students, K-12 educators, etc.

Key Findings: This column summarizes the main insights and outcomes reported in each study. For example, some studies found technological disparities, while others highlighted positive impacts of flipped classrooms.

Challenges Identified: This column outlines the specific issues or obstacles that were frequently observed in the studies. Challenges range from technology access and digital literacy gaps to emotional stress and faculty preparedness.

Opportunities Identified: This column lists the potential solutions or positive developments identified across the studies. Opportunities include the adoption of digital tools, development of SEL programs, creation of adaptive assessments, and the expansion of online resources.

Table 1: Summary of key studies

Study	Study Design	Population	Key Findings	Challenges Identified	Opportunities Identified
Fernández Batanero et al. (2021)	Qualitative	Secondary students	Technological disparities; stress among students and teachers.	Lack of technology access; high stress levels.	Adoption of digital tools; development of SEL programs.

Holm (2024)	Quantitative	University students	Lower engagement rates; varied digital literacy.	Engagement issues; digital literacy gaps.	Enhanced digital platforms; innovative teaching methods.
Bond (2020)	Mixed Methods	K-12 educators	Positive impact of flipped classrooms; need for continuous teacher training.	Teacher adaptation challenges.	Increased use of blended learning; professional development.
Arundell et al. (2020)	Systematic Review	Various levels	Consistent themes of equity issues; focus on mental health.	Equity gaps in technology access.	Mental health integration; use of collaborative tools.
Pennino et al. (2022)	Qualitative	Elementary students	High anxiety levels and disengagement; need for interactive learning environments.	Anxiety and disengagement.	Use of interactive tools; SEL focus.
Watson et al. (2023)	Quantitative	Higher education	Mixed results on learning outcomes; varied effectiveness of online assessments.	Issues with online assessments.	Adaptive assessments; collaboration tools.
Young & Clerke (2024)	Qualitative	Special education	Significant support needed for students with disabilities; varied accessibility to remote learning.	Accessibility issues.	Tailored content development; assistive technologies.
Yulianti et al. (2020)	Mixed Methods	Parents and teachers	Increased parental involvement; communication strains between parents and teachers.	Communication difficulties.	Enhanced communication platforms; parental engagement.
Nuryana et al. (2023)	Qualitative	High school students	Emotional stress due to isolation; demand for more student support systems.	Isolation impacts; support system gaps.	Development of support programs; use of online counselling.
Al-Tameemi et al. (2023)	Quantitative	Primary school students	Decline in academic performance; lack of motivation among students.	Academic decline; motivational issues.	Gamified learning; motivational strategies.
van de Werfhorst, Kessenich & Geven (2022)	Systematic Review	All educational levels	Variation in remote learning effectiveness; increased digital divide.	Digital divide; resource disparities.	Expansion of digital resources; development of inclusive platforms.
Singh, Steele & Singh (2021)	Mixed Methods	College students	Challenges with online engagement; preference for hybrid models.	Engagement challenges; preference for hybrid learning.	Hybrid learning models; engagement tools.
Jin et al. (2023)	Qualitative	Middle school students	Increased screen time; difficulty in maintaining attention.	High screen time; attention issues.	Development of attention-enhancing tools; screen time
Ormilla & Ongan (2024).	Quantitative	University faculty	Varied faculty preparedness for online teaching;	Faculty preparedness issues.	Digital training programs; faculty support systems.

			need for digital training.		
Zhou, Tigelaar & Admiraal (2022)	Mixed Methods	Vocational students	Limited access to practical training; challenges in virtual internships.	Lack of practical training access.	Virtual internships; enhanced practical training tools.
Creagh et al. (2023)	Qualitative	K-12 teachers	Increased workload; difficulties in adapting lesson plans for online format.	Increased workload; adaptation difficulties.	Development of adaptive lesson plans; workload management strategies.
Chowkase et al. (2022)	Quantitative	Elementary educators	Challenges with maintaining classroom discipline online; varied parental support.	Discipline issues; parental support variability.	Development of discipline strategies; parental support programs.
Banaag, Sumodevilla & Potane (2024)	Systematic Review	Secondary students	Increased dropout rates; disparity in access to educational content.	Dropout rates; access disparities.	Expansion of online content; targeted support for at-risk students.
Poling et al. (2022)	Mixed Methods	High school teachers	Strain on teacher-student relationships; need for better communication tools.	Strained relationships; communication gaps.	Improved communication tools; relationship-building programs.
Plotka & Guirguis (2023)	Qualitative	Preschool children	Limited engagement in remote learning; need for more interactive activities.	Engagement issues for young children.	Development of interactive learning activities; parental involvement.

Discussion

The studies examined reveal a comprehensive look at the multifaceted challenges and opportunities encountered in the transition to online learning across various educational levels. Secondary students faced significant technological disparities and stress, highlighting a critical gap in technology access and elevated stress levels among both students and teachers (Fernández Batanero et al., 2021). This suggests a need for the widespread adoption of digital tools and the development of social-emotional learning (SEL) programs to enhance student support and reduce stress. University students exhibited lower engagement rates and varying levels of digital literacy, underscoring issues related to engagement and digital skills (Holm, 2024). The study points to opportunities for enhancing digital platforms and incorporating innovative teaching methods to improve engagement and digital competency.

The adoption of flipped classrooms had a positive impact on K-12 education, though teacher adaptation posed challenges (Bond, 2020). The study advocates for greater use of blended learning models and ongoing professional development to support teachers in adapting to new instructional methods. The systematic review revealed persistent equity issues and a focus on mental health across educational levels (Arundell et al., 2020). Addressing equity gaps in technology access and integrating mental health support, along with the use of collaborative tools, could enhance inclusivity and student well-being. Elementary students displayed high anxiety and disengagement, necessitating more interactive learning environments (Pennino et al., 2022). The

findings suggest that using interactive tools and focusing on SEL could significantly enhance engagement and reduce anxiety.

Higher education faced mixed results on online learning outcomes, with effectiveness of online assessments varying (Watson et al., 2023). The study highlights the need for adaptive assessments and collaboration tools to better support online learning and assessment practices. Special education students required significant support due to varied accessibility to remote learning (Young & Clerke, 2024). The study underscores the importance of tailored content development and the use of assistive technologies to improve accessibility and support. Increased parental involvement and communication strains were noted among parents and teachers (Yulianti et al., 2020). Enhancing communication platforms and fostering greater parental engagement are seen as critical opportunities for improving collaboration and support.

High school students experienced emotional stress and isolation, calling for more robust support systems (Nuryana et al., 2023). Developing support programs and utilizing online counselling could address these issues effectively.

Primary school students showed a decline in academic performance and low motivation (Al-Tameemi et al., 2023) The study advocates for gamified learning and motivational strategies to boost academic performance and motivation. The systematic review identified variations in remote learning effectiveness and a growing digital divide (van de Werfhorst, Kessenich & Geven, 2022). Expanding digital resources and developing inclusive platforms are essential to bridge the digital divide and enhance learning effectiveness. College students faced challenges with online engagement, preferring hybrid learning models (Singh, Steele & Singh, 2021). The study suggests the development of hybrid learning models and engagement tools to cater to these preferences and enhance engagement. Middle school students encountered issues with increased screen time and maintaining attention (Jin et al., 2023). Creating tools to enhance attention and manage screen time is vital for mitigating these challenges.

University faculty varied in their preparedness for online teaching, with a noted need for digital training (Ormilla & Ongan, 2024). Providing comprehensive digital training programs and support systems is crucial for enhancing faculty readiness and effectiveness in online teaching. Vocational students faced limitations in practical training and virtual internships (Zhou, Tigelaar & Admiraal, 2022). The study suggests enhancing virtual internships and practical training tools to overcome these barriers. K-12 teachers dealt with increased workload and difficulties adapting lesson plans for online formats (Creagh et al., 2023) Developing adaptive lesson plans and strategies for managing workload are recommended to support teachers effectively.

Elementary educators faced discipline challenges and varied parental support (Chowkase et al., 2022). Developing effective discipline strategies and support programs for parents could help improve classroom management and parental involvement. Secondary students showed increased dropout rates and disparities in access to educational content (Banaag, Sumodevilla & Potane, 2024). Expanding online content and providing targeted support for at-risk students are critical to reducing dropout rates and addressing access disparities. High school teachers experienced strain in teacher-student relationships and needed better communication tools (Poling et al., 2022). Improving communication tools and developing relationship-building programs could enhance teacher-student interactions. Preschool children had limited engagement in remote learning, necessitating more interactive activities (Plotka & Guirguis, 2023). The development of interactive learning activities and increased parental involvement are vital for boosting engagement among young children.

Overall, these studies collectively highlight the importance of addressing technological disparities, enhancing digital skills, and developing supportive tools and programs to improve online learning experiences across all educational levels.

Implications for meaningful teaching and learning

The study provides a comprehensive analysis of the significant disruptions and adaptive strategies that emerged in the educational landscape during the pandemic. This review highlights critical implications for meaningful teaching and learning, offering insights that can inform future educational practices and policies. A fundamental implication of the study is the urgent need to bolster digital infrastructure and ensure equitable access to technology. The pandemic underscored the stark disparities in technology access among students, with many facing challenges in participating in remote learning due to a lack of devices or reliable internet connectivity. To address these issues, educational institutions and policymakers must prioritize investments in digital infrastructure. This includes providing adequate devices and internet access to students in underserved communities, ensuring that all learners have the tools they need to engage in digital learning environments.

The transition to remote learning highlighted the critical importance of digital literacy for both educators and students. Many teachers and students struggled with navigating online platforms and utilizing digital tools effectively. Therefore, enhancing digital literacy is essential for empowering educators to deliver effective online instruction and for students to participate fully in digital learning. Schools and educational bodies should implement comprehensive training programs to build digital competencies, integrating digital literacy into teacher training and student curricula to support seamless transitions between in-person and online learning. The pandemic exacerbated stress and anxiety among students and educators, making mental health and SEL a top priority. The study reveals a pressing need to incorporate SEL into educational frameworks to support the emotional well-being of students and staff. Schools should integrate SEL programs into their curricula and provide training for teachers to recognize and address mental health issues. Establishing virtual counselling services and support groups can also help mitigate the mental health challenges faced by the educational community, fostering a supportive and inclusive learning environment.

The crisis has highlighted the value of flexible and blended learning models that combine online and face-to-face instruction. These models offer greater flexibility and can better accommodate diverse learning needs and preferences. Educational institutions should develop and implement hybrid learning frameworks that allow for both in-person and remote participation. Designing courses with flexibility in mind can help ensure that learning remains accessible and engaging, regardless of the mode of delivery. The pandemic prompted the adoption of innovative teaching practices, which have the potential to enhance student engagement and learning outcomes. The study suggests that educators should be encouraged to explore and implement new pedagogical approaches, such as interactive, gamified, and project-based learning. Schools and educational authorities should support the development and dissemination of innovative teaching resources and strategies, offering incentives for educators to experiment with new methods and share their successes and challenges.

Effective communication and strong community engagement are crucial for supporting students and their families. The study indicates that enhancing communication channels between educators, parents, and students can help create a more supportive and collaborative learning environment. Schools should invest in user-friendly communication platforms and establish regular check-ins with students and parents to foster stronger relationships and ensure that everyone is informed and engaged in the learning process. Community forums and support networks can also facilitate the sharing of best practices and resources. The pandemic has highlighted and exacerbated existing educational inequities, making it essential to develop targeted strategies to ensure that all students have the support they need to succeed. The study suggests that schools and policymakers should focus on creating interventions for at-risk students, ensuring equitable access to learning resources and support services, and monitoring and addressing disparities in educational outcomes. By prioritizing equity, educational systems can work

towards closing the achievement gaps and providing all students with the opportunities they need to thrive.

Continuous professional development for teachers is crucial to equipping them with the skills and knowledge necessary for effective online and blended teaching. The study underscores the need for ongoing training programs that focus on digital teaching skills, pedagogical innovations, and student support strategies. Schools should create mentorship and peer collaboration networks for teachers to share experiences, challenges, and solutions, fostering a collaborative culture of continuous improvement and professional growth. In summary, the findings from this systematic review provide valuable insights into the challenges and opportunities that emerged during the COVID-19 pandemic. By addressing these implications, educational stakeholders can enhance the quality and equity of teaching and learning, building more resilient and adaptable education systems capable of supporting all students in achieving their full potential, now and in the future.

Conclusion

The study has comprehensively examined the profound impacts of the pandemic on educational systems globally. This review has highlighted both the significant challenges faced by educators, students, and institutions, as well as the opportunities that emerged for innovation and improvement in teaching and learning practices. The pandemic revealed critical disparities in digital access and literacy, which exacerbated existing inequalities in education. Many students, particularly those from disadvantaged backgrounds, faced significant obstacles in accessing online learning resources. Additionally, the rapid shift to remote learning exposed gaps in teachers' digital competencies, leading to varied levels of engagement and effectiveness in online instruction. Emotional and mental health challenges became more pronounced, with increased anxiety and stress levels among students and educators. These issues underscored the urgent need for robust support systems and resources to foster a healthy and productive learning environment.

Despite the substantial challenges, the crisis also created opportunities for significant advancements in educational practices. The rapid adoption of digital tools and the integration of innovative teaching methodologies, such as blended and gamified learning, have opened new avenues for enhancing student engagement and learning outcomes. The increased reliance on technology has accelerated the development of digital literacy among educators and students, paving the way for more effective and interactive learning experiences. Furthermore, the focus on mental health and social-emotional learning (SEL) has highlighted the importance of holistic approaches to education, promoting the well-being and resilience of the educational community.

The findings from this study suggest several key implications for future educational practice and policy. First, there is a pressing need to enhance digital infrastructure and ensure equitable access to technology for all students. Policymakers and educational institutions must prioritize investments in digital resources and connectivity, especially for underserved communities. Second, fostering digital literacy and competency among educators and students is essential for navigating the increasingly digital landscape of education. Continuous professional development and training programs should be expanded to build these crucial skills.

Moreover, the integration of mental health support and SEL into educational frameworks is vital for addressing the emotional and psychological needs of students and staff. Schools should develop and implement comprehensive SEL programs and provide accessible mental health services. Additionally, the development of flexible and blended learning models should be encouraged to accommodate diverse learning needs and preferences, ensuring that all students can succeed.

In conclusion, the COVID-19 pandemic has acted as a catalyst for transformative changes in the education sector, revealing both vulnerabilities and potential for growth. By addressing the challenges identified in this study and leveraging the opportunities for innovation, educational stakeholders can build more resilient,

inclusive, and effective education systems. The insights gained from this review provide a valuable foundation for shaping future educational policies and practices, ensuring that they are better equipped to support all learners in achieving their full potential in a rapidly evolving world. The lessons learned from this crisis should guide the ongoing development of educational strategies that prioritize equity, accessibility, and holistic well-being, ultimately fostering a more just and inclusive educational landscape for the future.

Disclosures

Conflict of interest

The authors declare no competing interest

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