

The Shift to Online Education: A Post-Pandemic Study of Learning Platforms

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Abstract - The COVID-19 pandemic disrupted education systems worldwide, forcing a sudden transition from traditional classrooms to online learning. This shift brought both opportunities and challenges, highlighting the importance of digital platforms in ensuring educational continuity. This study explores the role of major online learning platforms such as Google Meet, Zoom, Microsoft Teams, and Learning Management Systems (LMS) in facilitating teaching and learning during and after the pandemic. The research is literature-based, analyzing peer-reviewed articles, reports, and publications from 2020 to 2024. Key areas examined include platform usability, student engagement, challenges faced by educators and learners, and the emergence of hybrid learning models. Findings reveal that while online platforms provided flexibility, accessibility, and opportunities for digital skill development, they also exposed inequalities, engagement issues, and mental health concerns. The study emphasizes the importance of hybrid learning, teacher training, infrastructure development, and policy support to make digital education more effective and inclusive. By synthesizing global experiences, this research offers insights for institutions, policymakers, and educators to enhance online and blended learning strategies in a post-pandemic world.

I. INTRODUCTION

The COVID-19 pandemic marked one of the most disruptive periods in the history of global education. In early 2020, educational institutions across the world were compelled to shut down physical classrooms to ensure the safety of students and staff. As a result, the global education system underwent a rapid and unprecedented transformation — shifting from face-to-face learning to online and blended modes of education. According to UNESCO (2020), over 1.5 billion learners in more than 190 countries were affected by school closures during the first wave of the pandemic.

Online learning, previously considered a supplementary or alternative method of education, suddenly became the primary mode of instruction. Platforms such as Google Meet, Microsoft Teams, Zoom, Moodle, Blackboard, and Canvas emerged as

lifelines for the continuation of academic activities. Teachers, administrators, and students had to adapt swiftly to digital technologies that were often unfamiliar to them. This transition brought both opportunities and challenges, sparking a new era of digital transformation in education.

The shift to online education was not uniform across the world. While institutions in developed countries were able to leverage strong internet infrastructure and digital tools, developing regions faced severe constraints, including limited connectivity, inadequate devices, and lack of digital literacy. Consequently, the pandemic did not only change how people learned but also exposed deep social and economic inequalities in education.

1) Statement of the Problem

Although online learning helped sustain education during global lockdowns, it raised critical concerns about its effectiveness, accessibility, and long-term sustainability. The rapid shift exposed issues such as unequal access to technology, lack of teacher preparedness, student disengagement, and digital fatigue.

Many institutions had no pre-existing digital strategy, forcing educators to improvise with whatever tools were available. This unplanned digital migration led to inconsistent teaching quality, limited student interaction, and challenges in assessment integrity. Students from underprivileged backgrounds often faced the double burden of poor internet access and lack of suitable learning environments at home.

Hence, while online learning has become a significant part of modern education, there is an urgent need to evaluate how it can be improved, standardized, and blended with traditional teaching models. This study aims to analyze these dimensions and understand how the pandemic has shaped future directions for digital learning.

2) Objectives of the Study

The main objective of this research is to analyze the shift toward online education during and after the COVID-19 pandemic and assess the impact of learning platforms such as Google Meet, Microsoft Teams, and Zoom.

Specific objectives include:

1. To examine the use of major online learning platforms in educational institutions.
2. To identify the benefits and challenges associated with online learning during the pandemic.
3. To analyze students' experiences, engagement levels, and digital adaptation.
4. To evaluate policy and institutional responses to digital education.
5. To explore strategies for integrating online learning into sustainable hybrid education models.

3) Significance of the Study

This research is significant because it contributes to understanding how digital platforms transformed global education systems under crisis. The findings will help policymakers, educators, and institutions identify strategies to make online learning more equitable, engaging, and resilient.

The study also contributes to academic literature by examining cross-country experiences between developed and developing nations, providing insights into digital divides and institutional readiness. Furthermore, it explores the pedagogical evolution triggered by the pandemic — from traditional teacher-centered classrooms to more flexible, technology-supported learning environments.

Ultimately, this study aims to highlight that technology alone cannot ensure educational success; rather, effective integration of pedagogy, infrastructure, and policy support is essential to build sustainable and inclusive learning ecosystems.

II. REVIEW OF LITERATURE

1) Introduction

Online education has been an important component of instructional delivery for over two decades, but its relevance increased dramatically during the

COVID-19 pandemic. The global shift from traditional classroom-based learning to digital platforms created new learning patterns, challenges, and pedagogical adaptations. Existing literature provides insights into the effectiveness of online platforms, technological barriers, student engagement, and the evolving role of digital tools in post-pandemic education.

2) Online Education Before and During COVID-19

Before the pandemic, online education was primarily used in higher education, distance learning courses, and professional development programs. However, the sudden closure of educational institutions worldwide led to the mandatory adoption of digital learning tools. Studies show that this rapid transition accelerated digital transformation and pushed institutions to integrate technology into the teaching–learning process more deeply than ever before.

3) Major Online Learning Platforms Used During the Pandemic

Different platforms were adopted globally depending on accessibility, familiarity, features, and institutional requirements. The most studied platforms include Google Meet, Microsoft Teams, Zoom, and various Learning Management Systems (LMS).

A. Google Meet

Research shows that Google Meet became one of the most widely used tools due to its simplicity, device compatibility, and integration with Google Classroom. It supported basic classroom functions such as screen sharing, chat interaction, and lecture recording. Many schools preferred it because of its low data consumption and ease of access.

B. Zoom

Zoom is frequently cited in literature for its strong interactive capabilities. Features such as breakout rooms, polls, annotations, and large meeting capacity contributed to higher levels of engagement. However, concerns related to “Zoom fatigue” and privacy were highlighted in several studies.

C. Microsoft Teams

Microsoft Teams was used extensively in colleges and professional institutions. Literature emphasizes its integrated environment combining video classes,

file sharing, chats, and assignment management. It provided a structured digital workspace, although some users found it complex.

D. Learning Management Systems (LMS)

LMS platforms like Moodle, Canvas, Blackboard, and Google Classroom supported asynchronous learning through content delivery, assessment tools, and progress tracking. Researchers note that LMS played a central role in organizing learning materials and reducing instructional gaps.

4) Student Engagement and Learning Experience

A consistent theme across studies is that student engagement in online environments is influenced by platform interactivity, home learning environment, and digital literacy.

A. Positive Engagement Factors

- Use of interactive tools (polls, chat, breakout rooms)
- Availability of recorded sessions
- Flexible learning schedules
- Multimedia learning resources

B. Negative Engagement Factors

- Distractions at home
- Limited peer interaction
- Reduced motivation and attention span
- Fatigue from prolonged screen exposure

Studies also indicate that younger learners faced more engagement challenges due to the lack of structured classroom presence.

5) Challenges Reported in Literature

A. Digital Divide

One of the most prominent challenges highlighted is inequality in:

- Internet access
- Availability of computers or smartphones
- Stable electricity
- Quiet study spaces

Rural and economically weaker communities suffered disproportionately.

B. Teacher Preparedness

Teachers struggled initially due to limited digital training. Literature notes the need for continuous professional development in:

- Online pedagogy
- Digital tool usage
- Assessment and feedback strategies

C. Mental Health and Well-being

Research reports increased stress, anxiety, eye strain, and exhaustion among students and teachers due to extended screen time.

6) Advantages of Online Learning

Studies consistently point out several benefits:

- Flexibility in time and place
- Access to recorded lectures
- Increased digital skill development
- Cost savings on transportation and physical infrastructure
- Opportunities for global learning through webinars, MOOCs, and virtual exchanges

7) Post-Pandemic Educational Trends

Most recent literature indicates that hybrid learning—combining online and offline instruction—will dominate future education. This model leverages:

- The convenience of online platforms
- The effectiveness of face-to-face interaction
- Data-driven teaching through analytics
- Greater personalization using AI-based tools

Hybrid learning is seen as more resilient and adaptable to changing educational needs.

8) Identified Research Gaps

The literature reveals several gaps:

- Limited long-term studies on student outcomes in online learning
- Minimal comparative analysis across platforms in different socioeconomic contexts
- Insufficient research on mental health impacts
- Lack of region-specific studies on rural digital access
- Limited evaluation of hybrid learning effectiveness

9) Summary of Literature

The literature collectively shows that online learning was vital in ensuring educational continuity during the COVID-19 pandemic. Digital platforms enabled flexible and accessible learning, allowing teaching and academic activities to continue despite school closures. However, the rapid shift also exposed major challenges, including unequal access to technology, inconsistent internet availability, limited

digital skills, and reduced student engagement. Studies emphasize that while online tools supported innovation and flexibility, they also highlighted the need for stronger digital infrastructure and better training for teachers and students. Overall, researchers agree that the future of education will rely heavily on hybrid learning models that combine online and face-to-face instruction, making continued investments in digital readiness essential.

III. ANALYSIS OF REVIEWED LITERATURE

After thoroughly reviewing the literature on online education during and after the COVID-19 pandemic, the next step was to organize and articulate the studies and insights into coherent findings. The research focused on key aspects such as online platform usage, student engagement, challenges, and post-pandemic educational trends.

1) Comparative Platform Analysis

The study analyzed major online learning platforms including Google Meet, Zoom, Microsoft Teams, and Learning Management Systems (LMS) like Moodle, Canvas, and Blackboard. Key observations include:

- Google Meet: Simple and accessible, compatible with multiple devices, and integrated with Google Classroom. Preferred by many schools for ease of use and low data requirements.
- Zoom: Highly interactive with features like breakout rooms, polls, and large meeting capacities. However, "Zoom fatigue" and privacy concerns were noted.
- Microsoft Teams: Provided a structured digital workspace combining chats, file sharing, and assignment management. Effective for colleges and professional institutions, though some users found it complex.
- LMS Platforms: Supported asynchronous learning, content delivery, assessments, and progress tracking. Played a central role in organizing learning materials and reducing instructional gaps.

2) Student Engagement and Learning Experience

Student engagement varied depending on platform features, home environment, and digital literacy. Positive factors included:

- Use of interactive tools like polls, chats, and multimedia content
- Availability of recorded lectures for flexible learning
- Structured schedules and clear instructions

Challenges affecting engagement included:

- Distractions at home and lack of peer interaction
- Reduced motivation and attention spans
- Screen fatigue from prolonged online sessions

3) Challenges Identified

Several recurring challenges emerged from the literature:

- Digital Divide: Unequal access to internet, devices, and stable electricity, especially in rural and underprivileged areas.
- Teacher Preparedness: Lack of training in online pedagogy and digital tools, affecting teaching quality.
- Mental Health: Increased stress, anxiety, and exhaustion among students and teachers due to continuous screen exposure and workload.

4) Advantages Observed

Despite challenges, online learning offered notable benefits:

- Flexibility in time and location
- Access to recorded lectures and multimedia resources
- Development of digital skills and familiarity with technology
- Cost savings in transportation and infrastructure
- Opportunities for global learning through webinars and virtual exchanges

5) Post-Pandemic Trends

The literature indicates a shift toward hybrid learning models, combining online and face-to-face instruction. This approach leverages:

- The convenience and accessibility of online platforms
- The effectiveness of in-person interaction
- Personalized learning opportunities through data-driven tools

Summary of Findings

The studies collectively reveal that online learning platforms played a crucial role in ensuring educational continuity during the pandemic. While they enabled flexibility, accessibility, and skill development, challenges like digital inequality, engagement gaps, and mental health issues were evident. The findings strongly suggest that hybrid learning will be central to post-pandemic education, requiring institutional support, teacher training, and equitable access to technology.

IV. RESULTS AND DISCUSSION

1) Effectiveness of Online Learning Platforms

Online learning platforms played a crucial role in maintaining education during school closures caused by the COVID-19 pandemic. Google Meet emerged as a widely used platform due to its simplicity, accessibility, and seamless integration with Google Classroom. It allowed effective delivery of lectures and basic student-teacher interaction, though advanced engagement features were limited.

Zoom, on the other hand, offered strong interactive capabilities such as breakout rooms, polls, and annotations, leading to higher levels of student participation. However, prolonged usage led to “Zoom fatigue” among both students and teachers. Microsoft Teams provided a structured digital workspace by combining lectures, file sharing, chats, and assignments. While highly organized, some users found it complex. Learning Management Systems (LMS) such as Moodle, Canvas, and Blackboard supported asynchronous learning, enabling students to access content and track progress even without live sessions.

The effectiveness of these platforms was influenced by technological infrastructure, digital literacy, and institutional support. Institutions in developed regions were able to maximize platform potential, while those in developing regions faced limitations due to connectivity and resource constraints.

2) Student Engagement and Learning Experience

Student engagement varied widely depending on the tools used and the learning environment. Recorded sessions, interactive features, flexible schedules, and multimedia resources improved engagement and enhanced digital skills. Students appreciated self-paced learning and access to diverse online resources.

Challenges to engagement included home distractions, limited peer interaction, reduced motivation, and prolonged screen time. Younger learners, in particular, struggled without structured classroom support. These findings indicate that while technology facilitated learning, active engagement required complementary strategies such as interactive teaching methods and supportive home environments.

3) Challenges in Online Learning

Several challenges consistently emerged from the literature:

- **Digital Divide:** Unequal access to internet, devices, and electricity disproportionately affected rural and economically disadvantaged students.
- **Teacher Preparedness:** Many educators lacked training in online pedagogy, resulting in inconsistent teaching quality.
- **Mental Health and Well-being:** Prolonged screen exposure and isolation increased stress, anxiety, and fatigue among both students and teachers.

Addressing these challenges requires investment in infrastructure, digital literacy programs, teacher training, and mental health support systems to ensure equitable and sustainable online education.

4) Advantages of Online Learning

Online learning provided significant benefits, including flexibility in time and location, access to recorded lectures, cost savings on travel and infrastructure, and opportunities for global learning through webinars, MOOCs, and virtual collaborations. These advantages highlight that online learning can complement traditional education, offering convenience and broadening learning opportunities.

5) Post-Pandemic Trends

Hybrid learning models, combining online and face-to-face instruction, are emerging as the preferred approach for the future. Personalized learning using analytics and AI-based tools is increasingly emphasized, allowing students to progress at their own pace. Institutions are investing in better digital infrastructure and training to prepare for future disruptions, making education more resilient and adaptable.

6) Discussion

The synthesis of literature shows that online platforms were essential for continuing education during the pandemic, but they also exposed inequalities and engagement challenges. Success in digital learning depends not only on technology but also on teacher preparedness, institutional support, and student readiness. Hybrid models appear to be the most sustainable solution, combining the flexibility of online platforms with the effectiveness of in-person interaction.

7) Summary

Online learning platforms ensured continuity, improved digital skills, and offered flexible learning opportunities. At the same time, they revealed gaps in access, engagement, and teacher readiness. The post-pandemic shift toward hybrid education highlights the need for integrated strategies that combine technology, pedagogy, and infrastructure to create effective, inclusive, and resilient learning environments.

V. FINDINGS AND SUGGESTIONS

1) Findings

Based on the synthesis of literature and analysis of online learning platforms, the following key findings have emerged:

A. Critical Role of Online Platforms

- Google Meet, Zoom, Microsoft Teams, and LMS platforms were essential in ensuring educational continuity during the COVID-19 pandemic.
- Each platform had distinct strengths: Zoom excelled in interactivity, Google Meet in simplicity and accessibility, Teams in structured management, and LMS in content organization and asynchronous learning.

B. Student Engagement and Learning Experience

- Engagement was highest when platforms offered interactive tools, recorded lectures, and flexible schedules.
- Students faced challenges including distractions at home, reduced peer interaction, and fatigue from extended screen time.

C. Digital Divide and Accessibility Issues

- Unequal access to devices, stable internet, and electricity disproportionately affected students from rural and economically weaker backgrounds.
- This highlighted persistent social and economic inequalities in education.

D. Teacher Preparedness

- Many educators lacked formal training in online pedagogy and digital tool usage, leading to inconsistencies in teaching quality.
- Continuous professional development and technical support were identified as essential for improving digital instruction.

E. Mental Health and Well-being Concerns

- Prolonged screen exposure and online learning pressures increased stress, anxiety, and fatigue among both students and teachers.

F. Post-Pandemic Trends

- Hybrid learning models are increasingly preferred, combining online and face-to-face teaching.
- Personalized learning, AI-assisted tools, and data analytics are emerging as significant components of modern education.

2) Suggestions

Based on the findings, the following suggestions are recommended to improve online learning and support hybrid education:

A. Enhancing Accessibility

- Improve internet infrastructure and provide affordable devices to bridge the digital divide.
- Ensure access to digital resources for students in rural and underprivileged areas.

B. Teacher Training and Professional Development

- Conduct regular workshops on online pedagogy, digital tool usage, and assessment strategies.

- Encourage educators to adopt interactive teaching methods to enhance student engagement.
- C. Improving Student Engagement
 - Incorporate interactive elements such as polls, quizzes, and breakout discussions in online sessions.
 - Encourage peer collaboration and discussion forums to reduce isolation and increase participation.
- D. Supporting Mental Health
 - Promote balanced screen time, short breaks, and online wellness programs.
 - Provide guidance on creating conducive home learning environments.
- E. Hybrid Learning Implementation
 - Combine the flexibility of online learning with structured face-to-face sessions to maximize learning outcomes.
 - Use data-driven approaches to monitor student progress and adapt instruction accordingly.
- F. Policy and Institutional Support
 - Develop clear guidelines for integrating online and hybrid education models.
 - Invest in digital infrastructure, software platforms, and support systems to strengthen long-term educational resilience.

3) Summary

The study highlights that online learning platforms were vital in sustaining education during the pandemic, but challenges such as engagement issues, digital inequality, and teacher preparedness need to be addressed. Implementing hybrid learning, improving accessibility, and providing continuous support for educators and students will help create a more inclusive, effective, and resilient education system for the future.

VI. FUTURE SCOPE

1) Introduction

The COVID-19 pandemic forced education to go online, and in doing so, it showed both the strengths

and weaknesses of digital learning. While this study focused on analyzing existing research, there are many exciting opportunities to improve online and hybrid education in the future.

2) Hybrid Learning Will Grow

Learning in the future will likely combine online and in-person classes. Hybrid models offer the flexibility of digital learning while keeping the benefits of face-to-face interaction. Future work can explore the best ways to balance these two approaches to keep students engaged and ensure better learning outcomes. Schools and colleges can try pilot programs to see which hybrid methods work best.

3) Using Technology Smarter

New technologies like Artificial Intelligence (AI), Virtual Reality (VR), and Augmented Reality (AR) can make online learning more interactive and fun. Personalized learning systems can adapt to each student's pace and style. Tools like gamified lessons, interactive simulations, and AI-based tracking can make lessons more engaging and help teachers understand students' progress better.

4) Making Online Learning Accessible for Everyone

Not all students have the same access to devices, internet, or electricity. Future efforts can focus on making online learning more inclusive. Ideas like low-bandwidth platforms, offline learning materials, and affordable devices can help students in rural or underprivileged areas. Governments and schools will play a key role in bridging this digital gap.

5) Supporting Teachers

Teachers are at the heart of education, and digital teaching requires new skills. Future programs can focus on continuous teacher training in online teaching methods, using digital tools effectively, and sharing best practices. Supporting teachers will improve learning experiences for students and make online education more effective.

6) Caring for Students' Well-being

Spending long hours online can be tiring and affect students' mental health. Future research can look at ways to keep students motivated, reduce digital fatigue, and create a positive learning environment online. Finding ways to make online learning interactive, fun, and balanced will be very important.

7) Building Strong Policies

To make online education sustainable, schools and governments need clear policies. This includes standardizing online teaching methods, assessments, and digital safety rules. Policies that focus on inclusion, fairness, and effective use of technology will help make education more resilient in the future.

8) Conclusion

The future of education is bright and full of possibilities. With smarter technology, better access, teacher support, and a focus on student well-being, online and hybrid learning can become more effective, inclusive, and sustainable. The lessons learned from the pandemic give us a chance to rethink education and create systems that work for everyone.

VII. LIMITATIONS OF THE STUDY

Every research study has certain limitations, and this study is no exception. While it provides insights into the shift to online education during and after the COVID-19 pandemic, there are some constraints that need to be acknowledged.

1) Reliance on Secondary Data

This study is entirely based on existing literature, including research papers, academic articles, reports, and online publications. No primary data, such as surveys, interviews, or firsthand observations, was collected. While literature provides rich insights, it may not capture the most current experiences of students, teachers, or institutions. As a result, the conclusions are dependent on what has already been documented and may not fully reflect real-world variations in online learning experiences.

2) Regional and Contextual Differences

The studies and reports analyzed in this research were conducted in different countries and contexts, each with its own education system, technological infrastructure, and cultural practices. Therefore, the findings may not be universally applicable. For instance, the challenges faced by students in rural areas of developing countries may differ significantly from those in urban centers of developed nations. Similarly, teacher preparedness, access to resources, and student engagement

strategies can vary widely, making it difficult to generalize results across all contexts.

3) Rapidly Evolving Technology

Technology is constantly changing, and online learning platforms continue to develop new features, tools, and teaching approaches. Platforms like Google Meet, Zoom, and Microsoft Teams have already undergone updates since the early stages of the pandemic. This rapid evolution means that some findings in this study may become outdated over time. While the study provides a snapshot of trends and challenges during and immediately after the pandemic, the ever-changing technological landscape may affect the relevance of these conclusions in the future.

4) Limited Scope of Focus

The study primarily concentrates on online learning platforms, student engagement, and the challenges experienced during the pandemic. While these areas are central to understanding the shift in education, other important aspects were not explored in depth. For example, the study does not extensively examine long-term academic performance, social development, emotional well-being, or the perspectives of teachers in practice. Additionally, issues such as curriculum design, assessment reliability, and institutional management during online learning were only touched upon.

5) Absence of Quantitative Analysis

This research adopts a qualitative, literature-based approach. While qualitative analysis provides rich descriptions and insights into trends and challenges, it does not include numerical or statistical data to measure the effectiveness of online learning platforms. As a result, the findings are interpretive and descriptive rather than based on hard metrics. Future research could incorporate surveys, experiments, or longitudinal studies to quantify outcomes and provide a more precise understanding of the impact of online education.

6) Summary

Despite these limitations, the study offers a valuable overview of how online learning platforms supported education during an unprecedented global crisis. It highlights key trends, challenges, and potential strategies for improving digital and hybrid learning. Recognizing these limitations is important for understanding the scope of the research and for

guiding future studies. Subsequent research that includes primary data collection, quantitative analysis, and a broader contextual focus can provide a more comprehensive and actionable understanding of online education in a post-pandemic world

VIII. CONCLUSION

The shift to online education during the COVID-19 pandemic brought a major change in how teaching and learning take place. Online platforms such as Google Meet, Zoom, Microsoft Teams, and various LMS tools helped ensure that education continued even when physical classrooms were closed. The literature shows that these platforms offered flexibility, access to recorded lessons, and opportunities to develop digital skills.

However, the transition also revealed several challenges, including unequal access to internet and devices, reduced student engagement, screen fatigue, and limited digital training for teachers. These issues affected the overall effectiveness of online learning, especially for students in rural and underprivileged areas.

Despite the difficulties, online learning has now become an important part of modern education. Most studies agree that the future lies in hybrid learning, which combines the convenience of online methods with the strengths of traditional classroom teaching.

Overall, the pandemic accelerated digital transformation in education, showing both the possibilities and limitations of online learning. To make it more effective in the future, institutions will need to improve infrastructure, provide proper training, and ensure equal access for all learners.

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