Library Progress International *Print version ISSN 0970 1052*
Vol.44, No.3, Jul-Dec 2024: P.334-342 *Online version ISSN 2320 317X*

Original Article *Available online at www.bpasjournals.com*

Moving towards a Blended Tomorrow: The Evolution of EdTech in Education

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How to cite this article: Kathiravan Ravichandran, B. Anita Virgin, Meshach R S Edwin, V. Samuel Morris, Ben J Milton (2024) Moving towards a Blended Tomorrow: The Evolution of EdTech in Education, 44(3), 334-342.

ABSTRACT
Understanding the current state of education is essential in predicting what the future holds for the field. One of the most prominent features of the current educational technology (EdTech) landscape is the widespread acceptance of digital learning. The Corona epidemic had a dramatic influence on the schooling system, resulting in closures of schools and extensive use of online learning. As a result of the outbreak, there was a notable increase in the use of EdTech companies by students as schools raced to pivot towards online education, emphasizing the need for blending technology with traditional learning methods. Additionally, learning management systems (LMS) have been gaining traction in the education sector. LMS platforms like Canvas, Blackboard, and Moodle enable schools to deliver online courses and track student progress effectively. Educators can leverage these systems to efficiently manage assignments, develop and share online resources, and offer valuable feedback to their students. Education is constantly evolving with the integration of various educational technology tools and services, in addition to online learning and Learning Management Systems (LMS). Zoom and Google Meet are being used by virtual classrooms, while digital textbooks are becoming more popular for their accessibility and cost-effectiveness compared to traditional printed materials. As the educational environment undergoes rapid transformations, this study aims to forecast what is on the horizon for the education sector amidst these shifts in teaching and learning methods.

Keywords: Educational domain, Blended education, instructional technology platforms, virtual information, classic approaches.

INTRODUCTION

The educational landscape in India has undergone a significant transformation with the emergence of EdTech companies. These creative firms are revolutionizing.These creative enterprises Shaping the future of

education by revolutionizing mixing Engaging education with gamified interactions, offering tailored learning variations, and increasing access. Leading EdTech firms, including BYJU'S, upGrad, Unacademy, Vedantu, Physics Wallah, Eruditus, and others, have changed the way students learn by making classroom experiences more interesting and interactive. Projections outlined by the India Brand Equity Foundation (IBEF) suggest remarkable growth potential for the Indian EdTech industry, with figures expected to climb from $700-800 million in 2021 to $30 billion by 2031. According to KPMG, India have now eclipsed the United States as the world's second-topes e-learning market. Evolving the realm of education with the inclusion of gamified activities, interactive learning tools, personalized learning paths, and greater accessibility for all learners. The second largest market for e-learning is now held by India, surpassing the United States as stated by KPMG, with projections from IBEF showing a growth to $30 billion in the EdTech sector by 2031. Eruditus and other companies have changed the way students learn, making classroom experiences more interactive and engaging. This article delves into the various ways in which EdTech startups are influencing the education sector. Overall, the rise of EdTech companies in India is revolutionizing the way students learn and interact with educational content, paving the way for a more dynamic and engaging learning experience.

Understanding the present is crucial in predicting the future of education. A significant aspect of the current educational technology (EdTech) landscape is the widespread adoption of online learning. This shift has been largely driven by the COVID pandemic, which necessitated the cessation of schools and the rapid transition to remote learning. To ensure continuity in education, institutions, schools, and universities have been compelled to embrace technology, hastening the shift to online learning. The demand for online education has surged, with students increasingly turning to EdTech companies to enhance their learning experience. These platforms provide a wide range of courses in a variety of disciplines, Involving computer science, business studies, and historical research. They give educators armed with the appropriate tools to accomplish their task organize assignments, Build and circulate virtual resources, and deliver evaluations to students. The increasing popularity of digital textbooks as a simpler and cheaper option compared to printed materials has led online classrooms to adopt video conferencing platforms like Zoom and Google Meet for virtual learning sessions. Online learning and Learning Management System (LMS) platforms are just a few examples of the many EdTech technologies and services being utilized in the education sector. By using these cutting-edge resources, students can now learn in a more immersive and interactive way while teachers can deliver instruction more effectively.

Given the swift transformations in teaching and learning methods

Limitations to accessibility: Traditional campus education may be expensive and geographically limited, making it difficult for people who live far from school or cannot afford on-campus housing to access it.

Limited versatility: Students balancing job or family commitments may struggle with traditional learning environments' rigid scheduling and in-person attendance requirements.

Learning Speed: The traditional classroom paradigm, with its one-size-fits-all approach, may not be helpful in accommodating individual students' different learning styles and paces.

Development of socio-emotional skills: Campus atmosphere promotes cooperation the development of soft skills and emotional intelligence relies on the incorporation of peer-to-peer learning and social connections. These encounters offer students excellent opportunity to improve their interpersonal skills and emotional awareness, preparing them for success in their future undertakings.

organized academic atmosphere: The traditional classroom offers a designated environment for concentrated learning, a setting that can prove challenging to recreate in an online format for certain students.

Mentoring by faculty members: Engaging in face-to-face interactions with professors provides a unique opportunity for enhanced mentorship, tailored guidance, and the cultivation of meaningful relationship with education.

Inquiry and integrated learning strategies

In mixed learning, traditional classroom education is supplemented with digital resources is a prevalent approach in education. It has been referred as "new traditional model" (1) or "new normal" in the course delivery. However, due to the lack of a clear definition and the challenges institutions face in tracking this dynamic form of education, monitoring its progress has proven to be a complex task. A countrywide research undertaken by the Sloan (previously the Online Learning) discovered that 65% of higher education colleges offer blended (hybrid)

courses (2). In 2008, the American Education department conducted research that characterized blended learning as "a combination of online and in-class instruction with reduced in-class seat time for students" (3). The survey indicated that 35% of higher education institutions provided blended courses, and out of the total 12 million distance education enrollments, 12% were for blended courses. To summarize, blended learning is an important and developing trend in higher education, providing a versatile and creative method to course delivery.

Despite the difficulties in identifying and measuring its growth, the broad acceptance of blended instruction demonstrates its significance in modern education. Based to the 2017 New Media Consortium Horizon Report (4), blended learning methodologies are emerging as a significant short-term driver of technology use in higher education. EDUCAUSE Learning Initiatives' 2017 annual survey of higher education also identified blended learning as a significant teaching and learning challenge. As educational institutions investigate blended learning (BL), research into its impact on instructors and students expands. This strategy entails forming a community of practice around the question, "How does blended learning influence the teaching and learning environment?" Researchers are looking at how BL interacts with the cognitive, emotive, and behavioral components of student conduct. The importance of these challenges is reflected in the multiple volumes devoted to collecting research on blended learning (5). A conference focused on blended learning at every level of education and training is coordinated annually by the Online Learning Consortium.

This effort includes a wide range of topics, including K - 12 education, industry and military instruction, theoretical frameworks with transforming potential, genuine assessment, and novel research methods. A lot of these materials focus on pupil access, success, retention, perceptions of the usefulness of blended learning. The educational disparity in the United States amongst disadvantaged students and those possessing greater financial resources and access to machines is widening. Ensuring equal educational opportunities is crucial, particularly for marginalized communities. Can blended learning be a solution to improving educational equity and accessibility for low-income students? Many studies suggest that it can (6), but the definitive answer is still pending. The complexity of defining quality education complicates the matter (7). Despite these advancements, the issue persists. Quality education is often attributed to a course, program, or concept without a clear understanding of its essence. As Searle succinctly puts it, quality is subjective. Pirsig delves into the concept of quality in his seminal work, highlighting the challenges of defining it (8). The attempt to quantify quality through syntactic measures often results in oversimplified and inadequate models. Furthermore, metrics derived from these measures may inadvertently become the focus or benchmarks, losing their original purpose as evaluative tools (9).

The impact of ICTs on society and the way we learn in schools.

According to Alans perspective on blended learning, we are urged to reassess the impact of technology and ICTs in educational contexts, with him believing that these resources can autonomously handle information much like humans and other living organisms (10). These ICTs can communicate independently through processes created by humans. emphasizes the importance of humans being "on the loop" in Inventing and applying technology, rather than just being "in the loop." In today's world, we are increasingly viewing things through the lens of information rather than physical objects (11). Education is becoming more information-centric, and our economies rely heavily on it. Floridi suggests that humans exist within an "infosphere" as "inforgs," transitioning from static physical realities to interactive ones. Floridi's insights guide us in envisioning the future of education, where ICTs and specialized AI play a crucial role (12). Teachers have the opportunity to enhance essential human characteristics like empathy, creativity, and problem-solving skills by effectively merging learning analytics, adaptive learning, calibrated peer review, and automated essay scoring techniques.

This technological advancement not only optimizes resources but also enhances the quality of teaching by providing personalized feedback and coaching to students. The University of Edinburgh's online teaching manifesto boldly asserts that automation can enhance, rather than diminish, the educational experience - welcoming the collaboration of AI in education (13). By leveraging AI appropriately, we can gain valuable insights into human nature and education. This new educational paradigm will prompt us to reconsider curriculum and policy decisions, fostering a dynamic and ever-evolving learning environment. Floridi framework empowers us to navigate and shape the future of blended learning, enabling us to proactively engage with emerging trends rather than passively observing them (14).

Literature review

Kumar assert that blended learning, characterized by adaptable online information and communication technology, reduced class sizes, and structured teaching and learning experiences, offers students a more meaningful educational experience. This study uses surveys to investigate various blended learning technologies, techniques, frameworks, and models. The report comprehensively investigates about the students, instructors, administrators During the process of participating in blended learning classes the COVID epidemic and in year before it. According to the research, blended learning has been shown to benefit formal education settings such as schools, colleges, and businesses (15). In recent times, a plethora Several online and e-learning sites developed to enhance learners' abilities in blended learning environments. Vallee (16) discovered that in the realm of health education, blended learning consistently yielded better knowledge outcomes compared to traditional learning methods. However, further study is required to confirm these findings and investigate The value of diverse blended learning configuration techniques.

Hrast argues while the term "blended learning" is widely, its meaning remains ambiguous. What exactly does online learning entail? How does it work, and why is it beneficial? This paper examines various definitions, paradigms, and conceptualizations of blended learning, along with their implications. The literature encompasses a broad spectrum of educational approaches that combine face-to-face and online learning, (17) all falling under the umbrella of blended learning due to its inclusive nature. The term "blended learning" has become increasingly prevalent in educational discourse. Although these combinations might not be consistent with conventional conceptions of blended education, the phrase is frequently used to denote the combination of multiple methods of instruction, pedagogical approaches, and technology platforms. Bruggeman (18) highlight that while meeting students' needs for flexibility is a key advantage of blended learning in higher education, implementing it effectively remains a challenging task. As teachers play a central role in educational transformation, a recent qualitative study explores the essential teacher characteristics for successful implementation of blended learning, as perceived by experts (19).

Dakhi note that the education system has undergone significant changes due to the widespread adoption of technology, leading to improved digital skills among both students and educators. Furthermore, technology has a profound impact on our cognitive processes, learning methods, and communication patterns. To create a dynamic learning environment, educators are increasingly required to understand and incorporate technology into their teaching practices in order to keep pace with technological advancements. The utilization of video animation in blended learning was examined in a study involving 28 students from Management Study Program (20). The study revealed that students found blended learning to be beneficial in facilitating information absorption. Participants expressed that they were able to engage actively in lectures, leading to increased confidence and independence. The incorporation of animated films in blended learning was noted to enhance the overall learning experience, making it more enjoyable for students. Over 90% of pupils indicated that a tutor explained topics through videos helped them better understand online course materials. Specialists advise that integrating animated movies within blended learning can heighten student motivation and spark imagination (21).

The influence of the learning environment on university experiences was examined through a survey of sixty-six students enrolled in eight Blended Learning courses as part of a research study. The findings experimentally validated the hypothesis that Blended Learning improved students' views of their learning experiences (22). Analysis of survey items through factor analysis revealed specific patterns encompassing engagement, flexibility in learning methods, online learning experiences, and self-confidence levels. Evident variations in student’s opinions demonstrated contrasting views on the benefits of blended learning vary depending on their past experience to this approach (23). Recent findings from their study suggested that hybrid learning performed better than pure online instruction in terms of student concentration, self-assurance, and enjoyment. Compared to traditional classroom instruction, blended education was associated with a greater sense of personal satisfaction. Follow-up interviews provided researchers with further insights into how blended learning inspired students throughout their educational path. The study's findings provide persuasive evidence for the success of blended learning in addressing students' motivating demands, particularly in light of the trend toward online schooling following the Covid-19 outbreak. Contrary to widespread opinion, (24) Their most recent research revealed that hybrid learning demonstrated higher efficacy than pure online learning in student engagement, confidence, and overall satisfaction. When juxtaposed with traditional in-person learning, blended education was associated with enhanced subjective fulfillment (25).

On a different note, highlighted students' preference over online learning the absence of socio - components typically found in traditional classroom settings. From a policy standpoint, it is recommended to integrate social elements into blended learning to create a more engaging learning environment and address students' negative perceptions of transitioning from face-to-face to online/BL delivery. Practical suggestions for incorporating social components into netiquette frameworks are also provided to enhance the overall learning experience (26). Researchers have recently put forward an extensive list of cutting-edge research queries related to blended learning, with the goal of improving its efficacy in comparison to traditional in-person classes. In conclusion, the evolving landscape of blended learning necessitates continuous exploration and analysis to identify the most effective strategies for maximizing student outcomes and institutional success.

In light of the material studied, several forecasts are provided regarding the characteristics of the educational field:

1. Personalized Instruction: Personalization is the most revolutionary educational technology. EdTech businesses are transforming traditional classroom environments by tailoring learning possibilities to each individual student. By utilizing adaptive algorithms and artificial intelligence, students can access personalized information, work at their own pace, and receive instant feedback through online platforms. This method enhances learning outcomes by boosting student engagement and motivation.
2. Inclusivity and Accessibility: Providing equitable utilization of excellent education for all students is a key problem in our educational system. Pupils across a variety of origins and regions may now access Technological advances have enabled the accessibility of educational resources through online learning platforms, smartphone apps, and distance learning technology. EdTech enterprises empower marginalized groups by making not before possibilities for learning available.
3. Learning and engaging through interactive games: One of the most groundbreaking advancements in education technology is personalization. The landscape of traditional classroom environments is rapidly changing as EdTech visionaries customize learning opportunities for individual students. With adaptive platforms driving this transformation, students have the ability to access tailored content, advance at their own speed, and receive immediate feedback. This innovative approach not only improves learning outcomes but also enhances motivation and boosts student engagement.
4. Views Informed by Data: Data analytics play a critical role in improving teaching practices and student outcomes. EdTech companies use data to get important insights into Monitoring student progress, recognizing learning trends, and finding areas for improvement are all critical components of good teaching. Teachers may use student data to personalize their lectures, uncover learning gaps, and deliver targeted interventions. This data-driven strategy provides teachers with the knowledge they need to make educated decisions and improve their students' learning experiences.
5. Upcoming Tech: The world of education is rapidly evolving with the integration of cutting-edge technologies like AI, VR, and AR. Hands-on exploration is made possible through dynamic simulators, and VR/AR applications offer immersive educational experiences. AI-powered chatbots provide quick teaching and help. EdTech companies are at the forefront of integrating these innovative technologies into educational environments, creating dynamic and engaging learning experiences for students.

Some of the challenges envisaged are as under.

1. The challenge of integrating cutting-edge technologies into traditional educational systems is a significant hurdle for EdTech businesses. educators, organizations, and legislators who are used to old techniques may be hesitant to accept new technology and instructional styles. Bridging the gap between EdTech companies and educational organizations necessitates collaborative activities such as developing alliances, offering training, and establishing conducive settings that promote effective incorporation.
2. Data security and privacy: Data privacy and security are critical considerations for EdTech organizations, which collect and analyze massive volumes of student data. Maintaining confidentiality and ethical standards necessitates securing sensitive information and adhering to data protection requirements. To protect students' privacy, EdTech businesses must build strong security mechanisms, get appropriate consent, and set clear standards. Collaboration with regulatory organizations and adherence to data privacy standards might assist alleviate these issues.
3. Bridging the Digital Divide: Educational technology (EdTech) has significant promise for increasing access to education for all people. However, the ongoing difficulty of the digital divide remains a substantial hurdle.

Disparities in technological access and internet connectivity impede the successful adoption of EdTech solutions. Bridging this gap requires collaboration among governments, educational institutions, and EdTech entrepreneurs. Strategies for addressing these difficulties and promoting diversity include making devices more inexpensive, increasing internet connection in underdeveloped areas, and creating content for low-bandwidth contexts. Working together, we can guarantee that technology is used to empower students and provide fair opportunities in education.

4. Empowering Educators: Adequate Teacher guidance and instruction services are crucial for the successful integration of EdTech solutions in the classroom. Educators must possess a strong understanding of technology in order to effectively leverage it in their teaching practices. Professional growth seminars, and continuing support may prepare instructors to adopt novel to improve educational results, use new teaching approaches, combine educational technology tools, and use data-driven insights pupil educational results. Collaboration among EdTech firms and school systems can help to establish comprehensive teacher training programs.

5. Securing a sustainable trajectory of growth and scalability.: Durability and sustainability are common problems for educational companies. Creating a strong technological base, offering ongoing improvements and support, and maintaining financial viability are all critical factors. Collaborating with investors, education-focused organizations, and government agencies can offer valuable opportunities for growth and development necessary funding and support for expanding operations, reaching a larger audience, and ensuring long-term viability.

Accessibility of education

Despite advances in educational technology, a substantial barrier remains in terms of access to new educational techniques and resources, known as the digital divide (27). Digital technologies have the ability to improve educational possibilities for underprivileged and non-traditional learners by providing a diverse variety of educational resources and experiences to people who may lack access to traditional on-campus higher education (28). According to research, students from low socioeconomic origins are less likely to seek higher education. However, with the increased availability of remote learning, millions of people now have access to educational possibilities (29). Furthermore, current initiatives targeted at promoting open educational resources (OER) have resulted in considerable cost reductions while maintaining student accomplishment (30). These initiatives have made educational opportunities available to a broader spectrum of people, resulting in a more inclusive and equal educational landscape. Unfortunately, not all demographics have equal access to education 2015 study found that Hispanic and Black students majoring in STEM areas were much less likely to attend online courses, even when academic preparation, citizenship status, socioeconomic background, and English proficiency were considered (31). This raises questions over whether underprivileged populations are fully benefiting from growing access to online learning possibilities.

A report from the California Community Colleges Chancellors Office in 2013 found that ethnic minorities, with the exception of Asian/Pacific Islanders, had lower completion rates in distance education courses compared to the majority ethnic group. African American community learners who took part in remote schooling initiatives had considerably lower graduation rates than their peers who did not use online learning (32). However, a study determinant in distance education had significant disparities in test results for ethnic community. This shows that there may be additional factors impacting the success rates of certain groups in online education. More study is needed to investigate the accessibility and success rates of different types of education, including completely online and hybrid learning settings, for a diverse range of demographic categories. Addressing these differences is critical to ensure that all people have equal opportunity to succeed in the digital era of education (33). Defining a therapeutic outcome over the past decade, at least five meta-analyses have been undertaken to investigate the effects of blended learning environments on learning effectiveness. These research compared entirely online or conventional face-to-face settings to mixed learning and discovered little to moderate benefits in favor of the latter. However, the criteria used in these research may limit the generalizability of the findings (34). After analyzing Means and her colleagues' meta-analyses, it was decided that their procedures were sound, due to the use of scale-free effect size indexes and the inclusion of a wide spectrum of studies. Both studies found that courses that included online modalities, particularly blended courses, had minor improvements in key outcome indicators. Nonetheless, these findings pose concerns, particularly for blended learning (35). To ensure that any possible confounding effects in the mixing process do not distort the results, the effect sizes are initially estimated using the linear expectation test technique, which assumes that the treatment and error terms are

uncorrelated. Despite a thorough assessment of mixed-method articles (36), these meta-analyses should be approached with care because the assumption of independence is problematic. Furthermore, there is increasing worry about the deployment of blended learning. The different mixing procedures used in educational contexts are not equally successful (37). By carefully examining the literature cited in the Means papers, one can identify a variety of blending techniques, including machine labs, school internet pages, communication via email, distance education, connecting and building tools, machine groups, multimedia presentations, writing capture, research-based instruction, digital investments, management systems for learning, and online resources. These course setting techniques are clearly not mutually exclusive, resulting in uncertainty and inaccuracy in their use (38).

In this context, we argue that blended learning should not be viewed as a definitive treatment effect in statistical terms, but rather as a conceptual framework akin to a boundary object (39). This concept serves to facilitate collaboration within a community of practice, yet its lack of clarity can result in discord among stakeholders. However, within specific disciplines such as education, rhetoric, optics, mathematics, and philosophy, blended learning can be more precisely defined based on established teaching and learning principles. As Leonard Smith aptly points out, the complexity of the situation extends beyond a simple dichotomy. Each nonlinear system possesses unique characteristics, while linear models exhibit similarities (40). Therefore, caution must be exercised when interpreting effect sizes associated with blended learning, particularly within specific educational contexts. It is crucial to emphasize that these findings do not discredit the research carried out in this field.

Conclusion

The paper emphasizes the considerable effect of EdTech businesses on the education system, with an emphasis on India. Companies like BYJU'S, upGrad, and Unacademy are changing the educational environment in the country. The COVID-19 epidemic has expedited the use of remote education, driving the shift to digital learning platforms, learning management systems (LMS), and other EdTech innovations. Blended learning, which mixes in-person and online training, is a key trend in higher education, providing students with flexibility and tailored learning experiences. However, issues such as defining blended learning, assuring teacher preparedness, and closing the digital gap remain. The paper emphasizes the value of tailored training, diversity, and experiential education, which will be made possible by future advancements such as AI, VR, and AR. While the potential benefits of integrating EdTech into traditional educational institutions are numerous, maintaining data privacy and security, providing proper support and training for instructors, and tackling the digital divide all pose substantial challenges. Furthermore, the research recognizes inequities in access to online education, particularly among underprivileged and minority groups. It advocates for more study on the efficacy and accessibility of blended learning settings for a wide range of student populations. Finally, the research underlines the changing character of education as a result of technology improvements, as well as the need for stakeholders to negotiate the opportunities and problems that come with EdTech integration.

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