

A Review of Blended Learning after the COVID-19 Pandemic

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Received: March 26, 2024 Accepted: April 16, 2024 Published: April 19, 2024

doi: 10.5296/ire.v12i1.21849

URL: <https://doi.org/10.5296/ire.v12i1.21849>

Abstract

Blended learning (BL) is a combination of traditional face-to-face teaching and online learning methods. It is a very efficient alternative in post COVID19 era and it offers a solution to keeping safe distancing warranted by the COVID-19 pandemic. Blended learning harnesses the technological developments of the digital age while preserving the indispensable human factor and the advantages of face-to-face interaction intrinsic in the longstanding classroom setting. By harnessing the potentials of online and offline learning approaches, BL has become the most suitable option especially in higher institutions as it fosters independence in learning and brings about more meaningful learning experiences. Blended learning offers several academic advantages to both teachers and students among which are flexibility, student motivation, cost effectiveness, personalized learning experience, and improved academic performance. In addition, this learning method accurately fits the requirements of the post COVID-19 era while promoting students' essential 21st century abilities like problem-solving skills, information literacy skills as well as critical thinking skills. However, educational institutions have encountered a number of challenges in the implementation of blended learning. These include technological literacy and competence, students' isolation, technological complexity and technological sufficiency challenges. Regardless of these challenges, the several advantages inherent in blended learning made it a useful educational tool during the COVID-19 pandemic and in the post COVID-19 era.

Keywords: COVID-19, students, blended learning, teachers, digital technology, pandemic

1. Introduction

The sudden emergence and rapid spread of the coronavirus as a global pandemic gave rise to strict measures such as maintaining social distance (Pedersen & Favero, 2020; Herdiana, 2020), dealing unpleasant impacts on various sectors including education, which is a major tool for shaping a country's economic future (Corell-Almuzara *et al.*, 2021; Dreesen *et al.*, 2020; Jena, 2020; Thahir *et al.*, 2021; Teräs *et al.*, 2020). In order to mitigate the spread of the disease, countries all over the world implemented lockdown measures and social distancing on the recommendation of the world health organization as primary preventive measure. This made educational institutions to temporarily close down, suspending classes and postponing exams and other academic activities indefinitely, greatly impacting students' schedules. These devastating difficulties brought by the COVID-19 pandemic, it initiated a transition from the longstanding face-to-face methods of education to a digital education model (Ahmad & Zabadi, 2020). This modification has aided the widespread use of online learning throughout the world (Goldschmidt & Msn, 2020), making educational institutions to carry out a large scale evolution from the traditional face-to-face learning to distance or online learning systems (Basilaia & Kvavadze, 2020; Bao, 2020). The success of this shift however, depends significantly on many factors including access to internet connection and the availability of computers or smartphones within communities.

The COVID-19 pandemic has propelled distance education to unprecedented levels (Sun *et al.*, 2020), fundamentally transforming traditional campus-based learning. This outbreak shifted education from face-to-face learning to online formats virtually overnight. Even graduation ceremonies at many universities were transitioned to online platforms as a result (Dikti, 2020). In some countries, approximately 97% of institutions of higher learning have adopted online learning (Dikti, 2020), indicating a widespread adoption of this approach. Furthermore, online education serves as a concrete indication of technological advancements beyond the confines of the present-day Fourth Industrial Revolution. Despite the inability of students and educators to convene physically, online teaching and learning have proven to be effective methods, particularly during the COVID-19 pandemic (Verawardina *et al.*, 2020).

The conclusion of the pandemic narrative varies across countries in the world, contingent upon the efficacy of government policies in mitigating and managing the impact of the pandemic (Batubara, 2021). As the COVID-19 pandemic subsides and ushers in the era of the "new normal," (post pandemic era) life returns gradually to a shadow of normality. However, in higher education, there is a pressing need to redesign learning methodologies to align with the prevailing circumstances. Transitioning into the new normal post-pandemic entails reevaluating the learning process, particularly considering the widespread adoption of online platforms such as E-Learning by universities during the pandemic. Furthermore, as universities accommodate students with diverse preferences and learning styles, it becomes imperative to employ a variety of learning modalities to effectively deliver content in a manner suited to individual needs (Singh, 2003). Adjustment to the 'new normal' demands a flexible approach to learning, making sure that educational institutions can cater to the changing landscape of higher education.

As a response to the challenges posed by conventional teaching methods, alternative approaches such as blended learning have gained prominence (Garrison & Kanuka, 2004; Rooney, 2003). Blended learning integrates technology into the learning process, allowing for the utilization of online resources, in particular, web-based platforms, while still integrating face-to-face interactions. This learning model combines online activities commonly referred to as "e-learning" with traditional classroom techniques (Garrison & Kanuka, 2004; Macdonald, 2008; Graham, 2006).

The Center for Educational Research and Innovation (CERI, 2005), noted that blended learning programs are increasingly acknowledged as important, with information and communication technologies being developed to complement rather than replace conventional learning approaches (Mitchell & Forer, 2010). Therefore, the general adoption of digital technology has revolutionized the educational landscape. Blended learning ultimately stands out as a practical solution for conducting academic activities in universities during the new normal era.

The study aims to explore the following: review blended learning in the post-covid-19 pandemic era; the advantages presented by blended learning in our current world and; evaluate the challenges encountered in implementing blended learning.

2. Blended Learning

Blended learning (BL) is a combination of traditional face-to-face teaching and online learning methods. According to Voos (2003), Blended learning represents a modern approach to learning, intertwining traditional "face-to-face" classes with online learning components. According to Levin *et al.* (2013), blended learning is a ground-breaking educational system that combines the potentials of both asynchronous and synchronous learning approaches to effectively achieve academic objectives. Synchronous learning encompasses real-time, interactive teaching characteristically delivered through organized sessions (Shahabadi & Uplane, 2015). In this learning model, students and teachers interact simultaneously via platforms such as video conferencing or chat. For instance, a teacher can give his or her synchronous e-learning sessions through online platforms such as Google Meet or Zoom. This learning approach fosters a more communal learning environment, where students view themselves as valued members of a community rather than isolated students who only interact with a computer (Hrastinski, 2014). On the other hand, asynchronous learning encompasses an interactive learning approach that is not limited by time and space. This learning approach prioritizes the flexibility of e-learning, enabling learners to participate from anywhere and at any time convenient for them. For instance, students can access lesson materials, such as documents or PDFs, at any time convenient for them and communicate with teachers or other students in an asynchronous manner. Hrastinski further opined that this learning approach, which is characteristically carried out via online media like email and Google Classroom, enables communication between teachers and students even when synchronous interaction is not possible. The primary characteristics of blended learning are inherent in the combination of synchronous and asynchronous learning techniques (Sakina *et*

al., 2020), which establishes a comprehensive and dynamic educational experience. BL exists in a variety of formats. This gives users the flexibility to modify programs according to the resources available and their academic goals. These formats may include rotation of lab, rotation of station, individual rotation, flipped classrooms etc. (Christensen *et al.*, 2013). By leveraging blended learning, students can acquire knowledge more effectively. Several segments of the curriculum are delivered online, while others are facilitated by teachers through methods like lectures, webinars, etc. The synergy between online and instructor-led teaching fosters an integrated learning environment (Badre, 2020), enhancing the overall learning experience for students.

Blended learning offers students and teachers a comprehensive educational model that blends traditional classroom elements like lectures, textbooks, labs, and handouts with modern telecommunication technologies such as computers, the Internet, the World Wide Web, and mobile phones. This approach is increasingly popular in university settings due to its versatility and effectiveness. By integrating various delivery methods, blended learning not only provides more flexibility but also enhances learning outcomes. According to Azizan (2010), blended learning is anticipated to achieve several key objectives including:

1. Fostering social communication within the higher education community.
2. Enhancing students' competence and self-confidence.
3. Delivering a high-quality academic experience.
4. Cultivating cognitive skills within the school environment.
5. Utilizing technology as a valuable tool for content delivery to learners.

Various researchers have proposed blended learning frameworks, which typically amalgamate components from both conventional classroom delivery and e-learning means (Singh, 2021). One of such framework consists of eight dimensions: technological, academic, ethics, management, interface design, resource support, and evaluation. Every element in the model represents a group of challenges that require attention. Addressing these difficulties helps manage thinking and ensures that the learning program that fosters a significant learning experience.

3. Digital Educational Technology and Online Learning

The Method section describes in detail how the study was conducted, including conceptual and operational definitions of the variables used in the study, Different types of studies will rely on different methodologies; however, a complete description of the methods used enables the reader to evaluate the appropriateness of your methods and the reliability and the validity of your results, It also permits experienced investigators to replicate the study, If your manuscript is an update of an ongoing or earlier study and the method has been published in detail elsewhere, you may refer the reader to that source and simply give a brief synopsis of the method in this section.

According to Istifadah *et al.* (2020), the evolution of this era is evident through numerous changes impacting various domains such as business, education, social life, politics, and industry. These shifts have as well spurred a transition in education towards online platforms. E-learning necessitates technological infrastructure for its accomplishment. Several platforms, including Microsoft, Google Classroom, Zenius, Smart Class, Quipper, and WhatsApp, support free online learning discussions (Abidah *et al.*, 2020). The utilization of these platforms however relies heavily on technology.

Orton-Johnson (2009) opines that integrating technology into education is also an effort put in by institutions of higher learning to enhance the academic procedure and complement customary teaching techniques. Diversity is a hallmark of higher education, with classes comprising students from various cultural backgrounds, genders, learning preferences, language proficiency, and economic status. Technology plays a crucial role in supporting this diversity, offering diverse features catering to students with different backgrounds. For instance, Learning Management Systems are employed to handle the online learning atmosphere (Okaz, 2015).

Digital education technology encompasses all online technologies specifically developed or utilized for learning and teaching activities within informal or formal educational settings. “Educational technology capabilities” (ETC) which refers to a standardized series of functionalities inherent in various digital technologies, facilitates the achievement of specific learning objectives, such as personalization (Castro, 2019). The fundamental premise is that these capabilities are constructed from a distinctive amalgamation of technological traits and tool functionalities. Consequently, multiple capabilities may be present in individual tools, while a single tool can offer various capabilities. This perspective positions ETC as a framework for assessing and comparing technology executions and their prospective for transformative impact (Castro, 2019).

4. Advantages of Blended Learning

According to Voos (2003), Blended learning represents a modern approach to learning, intertwining traditional “face-to-face” classes with online learning components. This unification capitalizes on the strengths of both teaching models (Graham, 2006). Some of the benefits of blended learning are highlighted below:

Flexibility, Students motivation and Cost Effectiveness: Notable benefits include increased flexibility (Macedo-Rouet *et al.*, 2009) increased student motivation, as well as cost effectiveness, particularly when catering to large student groups (Harding *et al.*, 2005). This hybrid learning model outshines sole reliance on technology-driven method of education, as evidenced by previous research indicating drawbacks such as diminished interaction with teachers and peers (Laurillard, 1993), asynchronous learning delays (Lim, 2002), and decreased motivation for online material consumption (Lim & Kim, 2003). Blended learning holds promise in extending, augmenting, and potentially revolutionizing customary classroom experiences (Donnelly, 2010; Alexander, 1999), ushering in a shift in paradigm

from teaching-focused to learning-centered approaches (Nunan *et al.*, 2000). Significant findings imply that integrating online resources with in-person instruction impacts student performance positively (Boyle *et al.*, 2003; Lim & Morris, 2009; O'Toole & Absalom, 2003), fostering a flexible learning environment that reinforces student autonomy, reflection, and research prowess (Tam, 2000), while streamlining learning review and oversight (Osguthorpe & Graham, 2003). Moreover, blended learning enhances various pedagogical aspects, including accessibility, participation, student engagement, and flexibility (Garrison & Kanuka, 2004; Gomez & Igado, 2008; Alebaikan & Troudi, 2010), positioning it as a prevailing development in the educational ecosystem, particularly in higher institution settings (Maarop & Embi, 2016). Many authors have emphasized that students who have participated in blended learning value this educational model for additional benefits beyond the flexibility and accessibility of online courses. These benefits include hands-on interaction, improved learning, increased motivation, and more (Fearson *et al.*, 2012; Fabry, 2012). Similar trends are observed among students in the United Kingdom (UK), who opt for blended learning courses in pursuit of flexibility, additional support, motivation, opportunities for idea exchange, increased communication, and improved interaction (Fearson *et al.*, 2011).

Personalized Learning Experience: Blended learning seamlessly integrates traditional classroom education with digital technology. This approach gives students some autonomy over the pace, location, time, and content of their learning (Horn & Staker, 2011). Utilizing real-time data typically facilitated by digital tools, educators can tailor their teaching strategies to accommodate the diverse learning progress of their students (Horn & Staker, 2011). Teachers can effectively personalize lessons to meet the learning needs of each student across a variety of abilities (Powell *et al.*, 2014; Freeland, 2015). Blended learning supports whole-class teachings, small group activities, as well as individual study, fostering an inclusive and dynamic educational experience.

Enhanced Academic Performance: Additionally, in the United States, there is evidence of improved student achievement when comparing learning outcomes of blended learning approaches with those of traditional learning methods (Chan, 2011). Studies examining blended learning in higher education consistently show that students who participate in blended learning programs exhibit higher levels of motivation (Vaughan, 2014), enjoy greater support (Lim *et al.*, 2014), and benefit from more comprehensive learning materials (Kim, 2014) compared to their counterparts utilizing traditional classroom methods. This trend extends to both institutions of higher education and secondary schools, where “blended learning” is leveraged to customize learning experiences by offering learners a wider array of educational opportunities than what traditional classrooms can provide (Picciano *et al.*, 2012; Hilliard, 2015).

5. Challenges of Using Blended Learning in Higher Education

According to George-Walker and Keeffe (2010, 9) “the effectiveness of blended learning transcends mere integration of Information and Communication Technology (ICT) with the face-to-face (FTF) approach”. Employing a blend of learning materials can induce shifts in

methodologies and patterns of learning. Blended learning finds extensive application in extensive classroom settings, for instance, the first year of undergraduate studies, a pivotal period influencing students' commitment to university education (Huon *et al.*, 2007). Researchers have identified three basic challenges associated with this model of learning; these include challenges faced by lecturers, difficulties experienced by students, and difficulties encountered by educational institutions (Rasheed *et al.*, 2020). Blended learning challenges can be broadly classified into the following categories:

Technological literacy and competency challenges: In today's contemporary education landscape, technology and computer proficiency is essential for students, alongside several other skills expected from them. The capability of individuals to effectively utilize educational resources hinges upon their level of technological literacy and competency. Educational materials are increasingly integrated into technology platforms. Research findings highlight a notable issue with blended learning approaches - students often lack the necessary literacy in utilizing technology for educational purposes. As cited in Zacharis (2015), deficiencies in computer literacy and inadequate time management skills among students pose challenges in promptly receiving feedback from educators. Consequently, students may lose interest and procrastinate on their academic tasks.

Students' isolation challenges: Students require self-regulation skills and technological proficiency to manage their studies autonomously, whereas educators must possess technological competence to develop and share educational resources. Educational institutions must provide adequate training and technological support to facilitate the optimal use of available technology. At times, students may not be comfortable using gadgets like microphones, speakers, and video projection during synchronous learning sessions.

Technological complexity challenges: when students participate in online classes, they may sometimes become overexcited and distracted, diverting their attention away from the learning process. Such distractions may be as a result of the complexity of the technology itself or the use of technology that students cannot access at home, leading to non-educational usage of the technology. Educational institutions must therefore find a balance between fulfilling students' technological requirements and avoiding the introduction of too complex or unnecessary technology, which could potentially lead to the abuse or misuse of technological resources. In addition, replacing and updating systems that are outdated while considering students' technological needs and competence is crucial (Akçayır & Akçayır, 2018).

Technological sufficiency challenge: The challenges of technological accessibility cannot be overstated, particularly as blended learning mandates that students possess access to technology. Since it is necessary for students to have access to technology (including both software and hardware, whether provided by themselves or their educational institution) in order to effectively maximize blended learning, the challenge of technological accessibility cannot be overemphasized. Concerns among students regarding unequal access to technology and support from peers were noted by Akçayır and Akçayır (2018). Akçayır and Akçayır further identified issues among students related to poor internet connectivity for the online

component as well as outdated equipment. The use of blended learning may be perceived by students as biased if it results in them lagging behind their peers technologically. Additionally, students have expressed frustration over inadequate access to new learning tools and the disruption caused by sluggish internet speeds during online activities.

6. Pros and Cons of Blended Learning in the Post COVID-19 Era

The emergence of coronavirus (COVID-19) and the widespread adoption of blended learning (BL) has forced schools to face series of challenges for which they were unprepared. From the beginning of the crisis, educational institutions were forced to ensure the continuity of educational activities, leading to the implementation of training programs for educators on new academic methods and various online tools (Simón *et al.*, 2022; Verde & Alero, 2021). Concurrently, education institutions had to allocate resources toward enhancing infrastructure and acquiring apparatus to equip their facilities, students, and faculty with the essential resources to facilitate effective learning in this new setting (Roatta & Tedini, 2021; Al-Sholi *et al.*, 2021).

Schools were tasked with developing strategies to facilitate universal access to classes while prioritizing students' safety amidst the threat of contracting the disease (Yang & Huang, 2021). Furthermore, they had to confront the impending digital divide by providing computer equipment and assistance to mitigate disparities among students. This effort was complemented by the establishment of legal models to oversee technology integration, tackling issues such as privacy concerns emanating from mandatory activation of camera as well as ensuring fairness in student assessments (Area-Moreira *et al.*, 2021).

Notwithstanding, the adoption of BL has presented numerous opportunities for educational institutions especially institutions of higher learning. The pandemic underlined the importance of developing emergency plans to enhance preparedness for future similar situations and to effectively implement rapid responses. BL has shed light on the necessity of establishing continuous training programs for both students and teachers making use of online tools. Moreover, just as teaching methods are evolving, students' criteria for selecting a school are also changing. Students now consider the ability of schools to navigate adverse situations without having to compromising the quality of education. Hence, having pre-established plans can significantly influence the decisions of students regarding their choices of future schools (Al-Sholi *et al.*, 2021). From this perspective, the experience of implementing blended learning during the COVID-19 pandemic offers insights into the future projection of educational institutions. Blended learning has the potential to become a powerful factor in attracting students, regardless of their geographical location (Roatta & Tedini, 2021). This could enable schools to widen their global horizon while simultaneously increasing their revenue streams. Furthermore, as students engage regularly with school-managed online systems, educational institutions stand to gather a wealth of data on their behavior. This data can be leveraged to improve decision-making processes and fine-tune strategic development efforts within the school ecosystem.

Notwithstanding, the fundamental challenge with the greatest far-reaching consequences for the future lies in the capability to transform blended learning into a measurable teaching framework. The large student population in public schools, coupled with resource limitations, necessitates prioritization of dimensions that effectively address the needs of both schools and students. Thus, an unwavering commitment from schools' leadership to implementing such frameworks becomes indispensable. This commitment must be enduring, given the intricacy of the project, and must actively pursue the personnel and financial aid required for successful implementation.

Additional studies corroborate the difficulties outlined above. The sustained utilization of blended learning, or the formulation of specific implementation strategies, is deemed essential for readiness in future scenarios, alongside fostering the digital transformation of educational institutions (Ngoatle *et al.*, 2022). Addressing issues of inequality and accessibility prevalent particularly in developing countries, demands political involvement. Nevertheless, solutions combining the development of customized educational resources and more efficient academic approaches, without compromising learning opportunities, are also under review (Pokhrel & Chhetri, 2021).

Moreover, other studies advocate for the scalability of implementation, accentuating the importance of clear and precise measures to prevent educators from being overwhelmed (Zhang *et al.*, 2022). One of the primary issues listed by Baloran (2020) relates to psychological health concerns during the coronavirus pandemic. The possible challenges of ease of access and socialization inherent in BL can aggravate student's anxiety, prompting educational institutions to work out plans and tools to effectively help students.

7. Conclusion

Blended learning offers students and teachers a comprehensive educational model that blends traditional classroom elements like lectures, textbooks, labs, and handouts with modern telecommunication technologies such as computers, the Internet, the World Wide Web, and mobile phones. The COVID-19 pandemic prompted the widespread adoption of blended learning as it proved to be the most effective educational model during the COVID-19 pandemic. Blended learning provided effective solutions to the challenges of social distancing and lockdown warranted by the pandemic which inhibited academic activities during that time. As a result, blended learning has become a significant phenomenon in the education world even after the pandemic. Blended learning offers several advantages including flexibility, personalized learning and better learning outcomes. However, it also comes with a number of challenges such as lack of technological competence, poor internet connection, etc. in order to guarantee the effectiveness of blended learning, several factors must be considered, including sustained student motivation and engagement, adequate teacher training and support, and the quality of online learning materials. Teachers and students must possess expert knowledge of navigating technology platforms used for implementing BL for effective online teaching. Furthermore, teachers must possess the skills necessary for fostering collaboration and delivering meaningful education in the digital

sphere.

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Acknowledgments

Not Applicable.

Funding

Not Applicable.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Macrothink Institute.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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