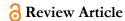
Journal of Research in Education and Pedagogy

ISSN 3047-7131 (online) & 3047-6410 (print) August 2025, Vol. 2, No. 3, pp. 334–345





Blended Learning: A Comprehensive Review of Recent Insights and Challenges

Khawlah Ahmed¹ [□]



¹Department of English, American University of Sharjah, Sharjah, United Arab Emirates

Abstract

As education evolves alongside rapid technological advancements, blended learning (BL) has emerged as a key pedagogical approach that combines traditional face-to-face instruction with online components. This integration aims to create flexible, personalized, and dynamic learning environments. Grounded in constructivist learning theory, this study employs a qualitative approach, analyzing existing literature and post-pandemic developments to assess the benefits and challenges of BL in higher education. The findings underscore the transformative potential of BL in enhancing student engagement, improving learning outcomes, and fostering greater autonomy. However, the study also highlights persistent challenges such as technological barriers, unequal access to digital tools, and gaps in digital literacy among both students and faculty. Effective implementation of BL depends on thoughtful instructional design, strong alignment between delivery modes, and the use of active learning strategies such as collaborative projects, discussion forums, and multimedia integration. Institutional support, including reliable technological infrastructure, professional development, and scaffolded learning opportunities, is crucial to address these challenges and ensure inclusivity. The study also calls for future research into the long-term impact of BL on academic performance, learner motivation, retention, and psychological well-being. Emerging technologies like artificial intelligence (AI), virtual reality (VR), and learning analytics offer promising tools to enhance the personalization, adaptability, and scalability of BL environments. However, their integration demands deliberate policy planning, ethical oversight, and sustained investment. For educators, instructional designers, and policymakers, this study provides actionable insights that can be used to inform curriculum development, strategic planning, and institutional readiness for future educational models.

Keywords: Blended Learning, Online Education, Online Learning, Technology

Khawlah Ahmed khawlah@aus..edu

Received January 7, 2025 Accepted June 30, 2025 Published August 1, 2025

Citation: Ahmed, K. (2025). Blended learning: A comprehensive review of recent insights and challenges. Journal of Research in Education and Pedagogy, 2(3), 334-345.

DOI: 10.70232/jrep.v2i3.64

© 2025 The Author(s). Published by Scientia Publica Media



This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial License.

1. INTRODUCTION

Technology has profoundly transformed education, continuously reshaping the teaching and learning landscape. The pace of this transformation appears to parallel the rapid advancements in technology itself. A few decades ago, computers and laptops were the central tools in education. Today, tablets, smartphones, and artificial intelligence (AI) are playing increasingly prominent roles. This ongoing evolution necessitates an equally dynamic adaptation of teaching methods to align with technological advancements and the expectations of tech-savvy students.

The demand for online distance learning has increased in the past decades, significantly impacting post-secondary education (Moller, Foshay, & Huett, 2008). Online learning has transformed academia, especially in the higher education context with higher education institutions incorporating online education and offering some form of online learning. Reasons for this are many, whether it is reaching out to global markets (Casey, 2008), the "shrinking budgets and lower local student enrollments at universities" (Desai, Hart, & Richards, 2009, p. 328), or as in the case of the coronavirus disease (COVID-19) pandemic which disrupted global interaction, closing borders and shutting down regions (Alon et al., 2020). Online learning



may not be new, especially after the coming about of initiatives to supplement the face-to-face traditional classroom such as MOOCS's (Massive Open online Courses). But the initial purpose was to supplement conventional classes instead of replacing them, and within the pandemic context, it was a practical choice. Due to the Covid 19 pandemic and social distancing, teaching was conducted online, which led to the acceleration of online learning and teaching in institutions across the world and resulting in today's need for blended learning.

Today many universities incorporate Learning Management Systems (LMS) with a focus on platforms such as Blackboard, Desire2Learn, and Moodle. Publishing companies like Pearson and McGraw Hill Education provide online learning management systems. McGraw Hill's Connect, a prominent course management system, has been extensively used pre and post Covid, across higher education institutions globally. Connect boasts 680 course titles and covers over 71 disciplines, impacting millions of instructors and students (McGraw Hill Education at a Glance, 2016).

As education continues to adapt to rapid technological advancements, blended learning (BL) has emerged as a pedagogical approach that seeks to integrate the benefits of both traditional and online education. This transition reflects a broader trend of leveraging technology to enhance educational experiences, providing a flexible and dynamic learning environment. BL combines face-to-face instruction with online components, aiming to offer a more personalized and accessible learning experience.

This paper explores the various aspects of BL, focusing on its impact on teaching effectiveness, student engagement, and potential challenges. Despite the growing reliance on blended learning, further examination of its impact on educational engagement and learning outcomes is necessary.

1.1. Need for the Study

The rapid transition to online learning environments during the COVID-19 pandemic has sparked considerable debate and controversy. This shift has led researchers and educators to reconsider and reframe the concept of online learning. According to Johnson, Veletsianos, and Seaman (2020), the term "online learning" is being avoided in favor of more precise terms that describe the mode of delivery and the context of the pandemic, such as "emergency remote teaching." This shift emphasizes the temporary nature of the changes and the urgent adaptation to fully remote teaching solutions due to crisis circumstances. Bates et al. (2020) differentiates online learning from remote education, noting that online learning involves courses intentionally designed for a virtual environment, using specific pedagogical strategies. In contrast, remote education during the pandemic represents an emergency response to a situation that would otherwise have been delivered face-to-face or in a blended format.

Current research is investigating various aspects of this forced transition, including the effectiveness of online lectures (Aswasulasikin, 2020), the use of online platforms to resume classes (Carrillo, 2020), and students' satisfaction and expectations for the post-pandemic "New Normal" (Krishnapatria, 2020). These studies highlight the necessity of understanding the impacts and effectiveness of this sudden shift to online learning, further supporting the need for ongoing research into the evolving educational landscape.

1.2. Theoretical Framework

Blended learning is grounded in constructivist learning theory, which emphasizes the role of active, student-centered learning experiences. Constructivism, as articulated by Piaget (1976) and Vygotsky (1978), posits that learners construct knowledge through interactions with their environment and through collaboration with others. This theoretical perspective supports the idea that learning is an active, dynamic process where learners build upon their prior knowledge and experiences.

Blended learning (BL) integrates various instructional methods, such as interactive online forums and self-paced learning modules, which align with constructivist principles by promoting active engagement and personalized learning. For instance, Garrison and Vaughan (2008) argue that BL environments facilitate a combination of face-to-face and online interactions, enabling learners to construct knowledge collaboratively and independently. Similarly, Graham (2006) highlights that BL supports diverse learning styles and allows for flexibility in how learners engage with material, which aligns with Vygotsky's (1978)

notion of the Zone of Proximal Development where learners are guided by more knowledgeable peers or instructors.

By providing opportunities for self-directed learning and collaborative problem-solving, BL fosters deeper understanding and retention of knowledge. Anderson (2011) emphasize that BL environments support a range of instructional strategies that cater to different learning preferences and needs, thereby enhancing the overall learning experience. This approach not only supports diverse learning styles but also facilitates deeper understanding through personalized and collaborative learning opportunities (Bonk & Graham, 2006; Chou 2023).

2. METHODS

This study utilizes a qualitative research approach through a narrative literature review to examine the advantages and disadvantages of blended learning (BL) in higher education. The review followed a systematic approach to ensure transparency, rigor, and replicability.

2.1. Search Strategy

Key academic databases such as Scopus, ERIC, JSTOR, and Google Scholar were used to locate relevant studies. The search included studies published between 2014 and 2024, using search terms and Boolean operators such as: ("blended learning" OR "hybrid learning" OR "mixed-mode instruction") AND ("higher education" OR "university") AND ("advantages" OR "benefits" OR "challenges" OR "limitations").

2.2. Data Collection and Analysis

Inclusion criteria required sources to focus on higher education contexts, present empirical or theoretical discussions on BL, and present the advantages and/or disadvantages of BL. Excluded materials were non-scholarly articles, conference abstracts without full texts, and sources not available in English. Full texts of selected studies were then reviewed using a standardized data extraction form, which captured information such as the publication details, methodology, participant characteristics (if applicable), key findings, and conclusions. The collected literature was then analyzed using thematic analysis to identify recurring themes and patterns related to the impact of BL on teaching effectiveness, student engagement, learning outcomes, and institutional practices. The themes were derived inductively by reading and rereading the selected literature, followed by open coding and categorization based on similarities and differences in findings.

2.3. Study Quality and Risk of Bias

The quality of the studies included were assessed using a checklist which included criteria such as clarity of research aims, appropriateness of methodology, and transparency of findings. To assess potential bias, the review considered selection bias, publication bias, and reporting bias. Studies with incomplete data, unclear methodologies, or non-peer-reviewed status were either excluded or noted with limitations in the synthesis.

3. RESULTS

3.1. Blended Learning: Briefly Defined

According to Singh and Thurman (2019) blended learning refers to educational experiences that take place in real-time or at the learner's convenience through internet-connected devices such as smartphones or laptops. This approach allows students to learn from any location while engaging with their instructors and peers. BL is grounded in a constructivist approach that utilizes online social networks and social networking sites accessible to both students and teachers (Saekhow, 2015). E-learning, a component of BL,

generally has positive outcomes by promoting active student engagement and interaction with the content (Lister, 2014) and encouraging the development of diverse e-materials (Ibrahim & Febriani, 2018), including lecture slides, videos, and forum messages (Li & Tsai, 2017). It represents a combination of online information and communication technology-based learning with conventional methods, aligning with the principles of Blended Learning (Prayitno, 2015). During the COVID-19 pandemic, online learning became ubiquitous through university-provided network systems and applications (Sintema, 2020).

Blended learning merges traditional face-to-face instruction with online learning, integrating technology into conventional teaching methods to create a blend of old and new. This approach supports deep, meaningful learning while preserving the values of traditional higher education (Syakur et al., 2020) and has the potential to enhance the effectiveness and efficiency of learning experiences through advanced technology (Ichsan et al., 2020). Terms such as "online learning," "web-based learning," and "blended learning" reflect the common feature of utilizing network-connected computers for learning from any location, at any time, and at any pace (Cojocariu et al., 2014).

According to Ferriman (2013), blended learning is a formal education program where student learn through online delivery of content and instruction where students have some degree of control over time, place, path, and pace. Ferriman identifies six distinct models of blended learning: Face-to-Face driver, Rotation, Flex, Online lab, Self-blend, and Online driver. Giarla (2022) further elaborates these models as follows:

- 1. Online: Teaching is primarily conducted through a digital platform, complemented by occasional inperson sessions.
- 2. Rotation: Learners alternate between online, self-directed study and classroom-based instruction, following a structured yet adaptable timetable.
- 3. Flex: Most of the teaching happens online, while educators offer targeted assistance to small groups when necessary.
- 4. Personalized blend: Educators create a customized mix of in-person and online learning experiences, merging physical and digital environments, where learning pace varies and time is adjusted accordingly.
- 5. Online lab: Learning is facilitated online within a designated physical lab space, overseen by on-site support staff while the instruction itself is delivered remotely.
- 6. Self-blend: Students enroll in additional online courses to complement their conventional, in-person classes.
- 7. Face-to-face: Instruction mainly occurs in person, with digital tools used to enhance lessons either in the classroom or computer lab.

3.2. Advantages of Blended Learning

Blended learning offers numerous advantages for both instructors and students, as it integrates online and face-to-face education, leveraging the strengths of both modes. Recent studies reinforce these findings, highlighting how BL can significantly improve student engagement and satisfaction (Garrison & Vaughan, 2008). Research also indicates that BL can enhance students' critical thinking skills, particularly when combined with problem-based learning approaches (Lepp et al., 2021).

According to Tang and Byrne (2007), BL enhances distance support, tutoring effectiveness, digital material sharing, faculty workload distribution, and student assessment. They show that students have reported higher satisfaction with BL compared to purely online or traditional formats. More recent studies have found that BL facilitates better retention of knowledge and promotes active learning, especially in STEM fields (Bernard et al., 2014; Means et al., 2020).

Larsen (2012) contends that blended learning goes beyond just reducing costs; it offers educational depth, broader access to information, opportunities for social engagement, increased learner autonomy, financial efficiency, and the flexibility to update content easily. Graham, Allen, and Ure (2003, 2005) support these claims by emphasizing BL's improved pedagogy, increased access, and flexibility.

According to Tang and Byrne (2007), the blended format of education presents several advantages from the viewpoints of instructors and managers. These include:

- 1. Improved Distance Support: Enhanced ability to support faculty in course delivery from a distance.
- 2. Effective Tutoring: More efficient delivery of tutoring services to students.
- 3. Digital Resource Sharing: Easier sharing of digital course materials and learning objects.
- 4. Workload Sharing: Greater distribution of faculty workload.
- 5. Virtual Learning Communities: Better development of virtual learning communities.
- 6. Assessment and Feedback: Increased efficiency in student assessment and feedback.
- 7. Program Management: More effective management and monitoring of programs.

Blended learning provides several key benefits that enhance student engagement, learning experiences, and overall satisfaction. Table 1, compiled from Giarla (2022), illustrates that BL methods often lead to greater student engagement and improved academic outcomes compared to purely traditional or online methods. These points underscore the value of integrating BL into educational practices.

Table 1. Benefits of Blended Learning for Students

Benefit	Description
Cost and Time Efficiency	Less expensive and more time-efficient
Flexibility	Access materials anytime and anywhere
Global Resource Access	Access to diverse resources
Self-Pacing	Adaptation to individual learning speeds
Enhanced Interaction	Improved communication with instructors
Progress Tracking	Ability to monitor progress
Diverse Learning Activities	Activities catering to various learning styles
Quality of Teaching	Potential for higher-quality teaching

In general, research and literature show that blended learning provides benefits that improve student engagement and learning outcomes. Below is a general culmination of these benefits.

- 1. Increased Interest: Technology integration makes subjects more engaging, especially those that
- 2. may otherwise be perceived as monotonous.
- 3. Extended Focus: Access to online resources helps students stay focused for longer periods.
- 4. Autonomy: E-learning materials foster independence and goal-setting skills.
- 5. Self-Advocacy: Encourages students to track their achievements and seek resources independently.
- 6. Ownership: Instills a sense of responsibility and ownership over learning.
- 7. Instant Feedback: Quick analysis and feedback on student work enable tailored teaching methods.
- 8. Pace Flexibility: Students can learn at their own pace, with teachers providing advanced resources as needed.
- 9. Future Preparedness: Blended learning cultivates real-world skills such as research, self-engagement, decision-making, and computer literacy.

As seen above, blended learning has been widely recognized for its benefits. Recent studies have demonstrated that BL improved learner engagement and enhanced learning outcomes and can lead to higher student satisfaction and better academic performance compared to traditional methods (Brown, 2022; Tabassum et al., 2024).

Therefore, the integration of technology allows for more personalized learning experiences and supports various learning preferences. Blended learning stands out as a versatile and effective educational approach, offering a range of benefits for both instructors and students. It brings together the benefits of in-person teaching and the convenience of online learning, resulting in a more dynamic and interactive learning experience. As educational institutions continue to evolve and adapt to technological advancements, blended learning presents a promising solution for addressing the diverse needs of modern learners while improving teaching conditions and outcomes.

3.3. Disadvantages of Blended Learning

Yet despite these advantages, research has shown that there are many challenges that come with BL contexts. BL also has notable disadvantages and challenges. Much of the research analyzed seem to agree on two aspects that pose challenges for blended learning context: dependence on technology and the need for substantial teacher training, succinctly presented by Walker (2018):

3.3.1. Dependence on Technology:

- Schools must have the necessary infrastructure, tools, and financial resources to support the technology required for blended learning environments.
- Technology issues, such as glitches or outages, can disrupt blended learning plans and hinder instruction.

3.3.2. Teacher Time and Training:

- Teachers require training in technology usage and must be prepared to manage and regulate activities throughout the instructional period.
- Although technology can streamline some aspects of teaching, teachers still need to provide one-on-one instruction to individuals and small groups.
- Teachers spend additional time analyzing data from digital education programs to create individualized reteaching plans for students needing extra assistance.

3.4. BL and Challenges Post Covid Pandemic Context

The post Covid context is also showing additional challenges that were not in the forefront of discussions. The rapid shift to online learning during the COVID-19 pandemic exposed significant disparities in access to technology, particularly in underserved communities (Bozkurt et al., 2022). In addition, it highlighted the need for robust technical support systems to mitigate disruptions cause by technology issues, which can seriously disrupt and hinder the blended learning plans and instruction (Hodges et al. (2020).

Research has underscored the importance of ongoing professional development to ensure educators can effectively integrate technology into their teaching practices (Alharbi, 2022; Cam & Cok, 2024). Yet, current research shows teacher training aimed at managing and implementing BL strategies may not lead to positive impacts in the classroom. Henessey et al. (2022), in their extensive systematic review of 170 studies, highlight that although teachers in certain contexts have access to "locally contextualised forms of technology-mediated teacher professional development (TPD)"—including virtual coaching, social messaging, blended learning, video-based reflection, and subject-specific software—there is limited evidence supporting their long-term sustainability, cost-efficiency, or measurable impact on classroom practices and student learning. They emphasize that for technology-enhanced TPD to be truly effective, the involvement of skilled facilitators or knowledgeable peers is crucial, yet often underestimated, and that maintaining the interpersonal aspects of teacher learning is essential (Henessey et al., 2022, p. 1).

Additionally, today there are major concerns about student engagement and maintaining student motivation when talking about online academic environments. There are many studies that target online education addressing methods of improving or helping student learning in online or what is referred to as virtual learning environments, yet current research is highlighting the need to address issues related to motivation and student engagement and wellbeing (Boulton et al., 2019; Hews et al., 2022). It became apparent that during the Covid period, students became disengaged due to the new online education delivery (Daniels et al., 2021; Rincon-Flores et al., 2022) which basically resulted in students feeling isolated and disengaged (Rajan et al., 2024) due to the lack of physical contact (Ojo, et al., 2024). These feelings of isolation and disengagement seems to have continued and have become a concern to many educators post the pandemic era.

This lack of motivation and engagement on students' parts have led to struggling to keep abreast with their academic work and achieving course academic outcomes (Chiu, 2021). As a concept, engagement represents the students' ability to do their academic tasks because they are dedicated to their studies

(Mokgele & Rothmann, 2014). Engagement has been linked to success in both traditional learning contexts (Boulton et al., 2019) and online learning (see Chiu, 2021; Daniels et al., 2021). Engagement is deemed critical for learning (Bond, 2020; Martin et al., 2020) positive development and academic adjustments (Fredricks et al., 2019), for measuring effects of teaching quality and school interventions (Center for Postsecondary Research, 2018), and for predicting students' school success (Montgomery et al., 2019; Pöysä et al., 2018).

Both extrinsic and intrinsic motivation have been shown to predict students' engagement levels (Ryan & Deci, 2020). Moreover, in the current educational landscape, numerous elements must be taken into account when examining student engagement in academic settings. These include factors such as students' emotional well-being, constructive learning behaviors, supportive teacher actions, the quality of teacher-student relationships, learners' cognitive abilities, availability of educational resources, individual personality traits, and various instructional approaches (Li & Xue, 2023, p. 1). These factors can positively impact students' energy and motivation (Cilliers et al., 2018). However, when talking about BL and online learning components, as Bedi (2023) shows, achieving such engagement requires targeted solutions, ongoing support, and shifting to a new pedagogical paradigm.

4. DISCUSSION

Blended learning represents a valuable instructional approach that offers substantial benefits, including flexibility, engagement, and personalized learning and enhances teaching and learning by combining traditional and digital methods. The findings indicate that blended learning offers numerous benefits, for both students and teachers, which in general revolve around increased flexibility, enhanced engagement and more effective interactions, improved teaching conditions with greater access to resources, and personalized learning. The literature supports the notion that BL can significantly improve educational outcomes by combining the strengths of traditional and online learning.

However, recent research underscores the need to address the challenges that now prevail in BL academic contexts. Major challenges not only include distance, scale, and personalized teaching and learning (Dhawan, 2020), but BL also presents challenges related to technology and teacher training. Challenges such as technological dependence and the need for teacher training must be addressed to fully realize BL's potential. In other words, the effective implementation of BL requires overcoming technological and logistical barriers, which means that institutions must heavenly invest in infrastructure and provide adequate training for educators to ensure the successful integration of BL (Al-Samarraie et al., 2021). Addressing these challenges through proper support and training can help maximize the advantages of BL and improve educational outcomes. Lack of student motivation and engagement has also been shown to be of major concern in today's academic contexts, and the need to address many factors that relate to student wellbeing, motivation and engagement.

Future research should focus on exploring innovative solutions and strategies to overcome the identified challenges and further enhance the effectiveness of blended learning. Future directions show the need for new pedagogical paradigms of teaching and innovative solutions such as adopting new tools and strategies (Liguori &Winkler, 2020) and investing in and developing comprehensive BL programs that are tailored to meet the needs of diverse students (Tabassum et al. 2024). Some of the tools developed by Google, have proven useful as alternatives to face-to-face classes (Basilaia et al., 2020). Innovative solutions like targeted professional development programs and advanced Learning Management Systems (LMS) platforms also offer promising strategies for overcoming these issues. Post 2023, the integration of GenAI-driven chatbots and other technological advancements has significantly impacted the effectiveness of blended learning, with research yet to come out to show the results of using GenAI tools.

However, the challenge for academic institutions is not only to find and use new technology but also to reimagine educational practices to support digital literacy among students and faculty (Dhawan, 2020). Future research should focus on exploring these solutions further and developing best practices for implementing BL in diverse educational settings. Schools must work on providing the necessary infrastructure and support to handle technological requirements and adequately train teachers to manage both digital and face-to-face components. They need to deal with improvements in teaching conditions,

including reduced isolation, increased collaboration, and meaningful professional development (Giarla, 2022).

Online BL learning has become a necessity and referred to by many as the 'new normal' (Graham & Halverson, 2023), with many universities digitalizing their operations, reflecting the urgency and effectiveness of BL and online education. The primary concern is not whether BL and online learning can provide quality education but how institutions can adapt to such mode of delivery effectively. Institutions are judged based on their ability to adapt quickly and maintain educational quality whether it was during the transition forced by Covid, or in today's GenAI that is storming the academic as well as all the other industrial and business-oriented contexts.

5. CONCLUSION

This review has highlighted the multifaceted nature of blended learning (BL), underscoring its potential to transform traditional educational practices by integrating digital and face-to-face instructional modalities. The findings confirm that BL offers increased flexibility, enhanced student engagement, and the potential for improved learning outcomes. However, the literature also identifies key challenges, including inadequate technological infrastructure, disparities in digital literacy, and the need for ongoing professional development among educators.

The implications of these findings extend beyond classroom practice. For educational policymakers, the integration of BL calls for sustained investment in digital infrastructure and targeted strategies to bridge the digital divide. Institutions must prioritize the development of teacher training programs aligned with frameworks such as TPACK to ensure educators are equipped to deliver effective blended instruction. Furthermore, BL prompts a rethinking of pedagogical models—moving toward more learner-centered, adaptive, and technology-integrated approaches suitable for diverse educational contexts, including underresourced environments.

To improve the implementation of BL, several best practices emerge from the literature. Instructional design should emphasize clarity, interactivity, and alignment between in-person and online components. Educators are encouraged to adopt strategies that foster active learning, such as collaborative projects, formative assessments, and multimedia content. Addressing barriers like technological access and varying levels of digital literacy requires the provision of institutional support, including tech assistance and scaffolded learning opportunities for students.

While this review synthesizes current knowledge, it also reveals areas requiring further empirical investigation. Longitudinal studies are needed to assess the sustained impact of BL on academic performance, motivation, and student well-being. Comparative research across educational levels (e.g., primary, secondary, tertiary) can shed light on context-specific challenges and solutions. Additionally, there is a growing need to explore how emerging technologies—such as artificial intelligence (AI), virtual reality (VR), and learning analytics—can enhance the design, delivery, and personalization of BL environments.

For educators and instructional designers, the conclusions drawn here provide a roadmap for integrating evidence-based practices into curriculum development. Policymakers can use these insights to inform strategic decisions, from infrastructure investments to professional development frameworks. Ultimately, the effective implementation of BL hinges on a collaborative, well-supported approach that acknowledges the dynamic interplay between technology, pedagogy, and learner needs.

In sum, while BL holds considerable promise, its success depends on sustained research, informed practice, and inclusive policies. Future work should delve deeper into student experiences, particularly in marginalized or under-resourced settings, and evaluate how BL can be leveraged to create equitable, resilient, and innovative learning ecosystems.

Acknowledgment. Not applicable.

Research Ethics. Not applicable.

Data Availability Statement. All data can be obtained from the corresponding author.

Conflicts of Interest. The author declares no conflicts of interest.

Funding. This research received no external funding.

REFERENCES

- Alharbi, A. (2022). The relationship between ICT teachers' professional development and TPACK framework for the process of teaching and learning. *International Journal of Education and Research*, 10(12), 69-82. https://www.ijern.com/journal/2022/December-2022/06.pdf
- Almarzuqi, A. & Mat, H. (2024). The effectiveness of blended learning on STEM achievement of secondary school students. *International Journal of Academic Research in Business and Social Sciences*, 141(1). https://doi.org/10.6007/IJARBSS/v14-i1/20140
- Alon, T., Doepke, M., Olmstead-Rumsey, J., & Tertilt, M. (2020). The impact of COVID-19 on gender equality (No. w26947). National Bureau of Economic Research.
- Al-Samarraie, H., & Saeed, N. (2021). A systematic review of cloud computing adoption in education: Benefits, challenges, and future directions. *Computers and Education*, 147, 103779.
- Aswasulasikin, I. (2020). Students' perceptions and attitudes towards online lectures during the COVID-19 pandemic. Journal of Educational Technology and Society, 23(4), 58-72.
- Basilaia, G., & Kvavadze, D. (2020). Transition to online education in the context of COVID-19: The case of Georgia. Pedagogical Research, 5(4), 1-16.
- Bates, T., Cobo, C., Mariño, O. et al. (2020). Can artificial intelligence transform higher education? *International Journal of Educational Technology in Higher Education 17*(42). https://doi.org/10.1186/s41239-020-00218-x
- Bedi, A. (2023). Keep learning: Student engagement in an on online environment. Online Learning, 27(2), 119-136.
- Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: From the basics to the future. *Educational Technology Research and Development*, 62(4), 1-18.
- Bond, M. (2020). Facilitating student engagement through the flipped learning approach in K-12: A systematic review. *Computers and Education*, 151.
- Bonk, C. J., & Graham, C. R. (Eds). (2006). The handbook of blended learning: global perspectives, local designs. Pfeiffer Publishing
- Boulton, C. A., Hughes, E., Kent, C., Smith, J. R., & Williams, H. T. P. (2019). Student engagement and wellbeing over time at a higher education institution. *PLoS One 14*: e0225770. https://doi.org/10.1371/journal.pone.0225770
- Bozkurt, A., Karakaya, K., Turk, M. et al. (2022). The impact of COVID-19 on education: A meta-narrative review. *TechTrends* 66, 883–896. https://doi.org/10.1007/s11528-022-00759-0
- Brown, J. (2022). The impact of blended learning on student performance: A review of recent literature. *Journal of Educational Technology*, 45(2), 123-135.
- Çam, Ş. S., & Koç, G. (2024). Professional development program to develop teacher educators' technological pedagogical content knowledge. *Sage Open, 14*(2). https://doi.org/10.1177/21582440241242841
- Carrillo, C. (2020). The role of online platforms in resuming educational activities during the pandemic. *Educational Technology Research and Development*, 68(5), 87-100.
- Casey, D. (2008). A journey to legitimacy: The historical development of distance education through technology. *TechTrends*, 52(2), 45–51.
- Center for Postsecondary Research. (2018). Indiana University School of Education. NSSE National Survey of Student Engagement. http://nsse.indiana.edu/
- Chiu, T. K. F. (2021). Applying the self-determination theory (SDT) to explain student engagement in online learning during the COVID-19 pandemic. *Journal of Research Technology Education*. 54, 14-30. https://doi.org/10.1080/15391523.2021.1891998
- Chou, W. (2023). A meta-analysis of effects of blended learning on performance, attitude, achievement, and engagement across different countries. *Frontier Psychology* 14, 1212056. https://doi.org/10.3389/fpsyg.2023.1212056

- Cilliers, J., Mostert, K., & Nel, J. A. (2018). Study demands, study resources and the role of personality characteristics in predicting the engagement of first-year university students. *South African Journal of Higher Education*, 32(1), 49-70
- Cojocariu, V. M., Lazar, I. Nedeff, V., & Lazar, B. (2014). SWOT analysis of e-learning Educational services from the perspective of their beneficiaries. *Procedia-Social and Behavioural Sciences116*(1), 1999–2003.
- Daniels, L. M., Goegan, L. D., & Parker, P. C. (2021). The impact of COVID-19 triggered changes to instruction and assessment on university students' self-reported motivation, engagement and perceptions. *Social Psychology of Education*, 24, 299–318. doi: 10.1007/s11218-021-09612-3
- Desai, M., Hart, J., & Richards, T. (2009). E-learning: Paradigm shift in education. Education, 129(2), 327-334.
- Dhawan, S. (2020). Online learning: A necessity in the present times. Education and Information Technologies, 25(3), 1535-1552.
- Ferriman, N. (2013). The impact of blended e-learning on undergraduate academic essay writing in English (L2). *Computers and Education*, 60(1), 243-253.
- Garrison, D. R., & Vaughan, N. D. (2008). Blended learning in higher education: Framework, principles, and guidelines. Jossey-Bass.
- Giarla, A. (2022). The benefits of blended learning. https://www.teachthought.com/technology/benefits-of-blended-learning/
- Graham, C. R., Allen, S., & Ure, D. (2005). Blended learning environments: A review of research and practice. Educational Technology Review, 13(2), 23-37.
- Graham, C. R., Allen, S., & Ure, D. (2003). Blended learning environments: Theoretical foundations and practice. In M. G. Moore & W. G. Anderson (Eds.), *Handbook of distance education* (pp. 104-126). Lawrence Erlbaum Associates.
- Graham, C. R. (2006). Blended learning systems: Definition, current trends, and future directions. In Bonk, C.J. and Graham, C.R. (Eds.) *Handbook of blended learning: Global perspectives, local designs* (pp. 3-21). Pfeiffer Publishing.
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. EDUCAUSE Review. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning
- Graham, C. R., & Halverson, L. R. (2023). Blended learning research and practice. In Zawacki-Richter, O., Jung, I. (Eds.), Handbook of open, distance and digital education. Springer. https://doi.org/10.1007/978-981-19-2080-6_68
- Henessey, S., D'Angelo, D., McIntyre, N., Koomar, S., Kreimeia, A., Cao, L., Brugha, M., & Zubairi, A. (2022). Technology use for teacher professional development in low- and middle-income countries: A systematic review. *Computers and Education Open 3*,100080. ISSN 2666-5573. https://doi.org/10.1016/j.caeo.2022.100080
- Hews, R., McNamara, J., & Nay, Z. (2022). Prioritising lifeload over learning load: understanding post-pandemic student engagement. *Journal of University Teaching and Learning Practice*, 19, 128–146. https://doi.org/10.53761/1.19.2.9
- Smith, K., & Hill, J. (2019). Defining the nature of blended learning through its depiction in current research. *Higher Education Research & Development*, 38, 383-397. https://doi.org/10.1080/07294360.2018.1517732
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. Retrieved from https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning
- Ibrahim, D. S. M., & Febriani, Y. (2018).Pengembangan E-Materi Berbasis Mata Kuliah Pada PembelajaranJarak Jauh (E-Learning). *Jurnal DIDIKA: Wahana Ilmiah PendidikanDasar*, 4(2), 1. https://doi.org/10.29408/didika.v4i2.1170
- Ichsan, I. Z., Sigit, D. V., Rahmayanti, H., Purwanto, A., Rosyid, A., Suwandi, T., Ali, A., & Hermawati, F. M. (2020). Implementasi model pembelajaran ILMIZI dan peningkatan HOTS siswa SD berdasarkan gender pada pembelajaran lingkungan. JIPVA. *Jurnal Pendidikan IPA Veteran*, 4(1), 11–24. https://doi.org/10.31331/jipva.v4i1.1076
- Krishnapatria, K. (2020). Students' satisfaction and preferences for online learning during the pandemic. *Journal of Online Learning and Teaching*, 16(2), 50-65.
- Larsen, S. (2012). The benefits of blended learning: Beyond cost savings. Journal of Learning Design, 5(3), 1-15.

- Li, J., & Xue, E. (2023). Dynamic interaction between student learning behaviour and learning environment: Metaanalysis of student engagement and its influencing factors. *Behavior Science* 13(1),59. https://doi.org/10.3390/bs13010059
- Li, H. C., & Tsai, T. L. (2017). The implementation of problem-based learning in a Taiwanese primary mathematics classroom: Lessons learned from the students' side of the story. *Educational Studies*, 43, 354-369. https://doi.org/10.1080/03055698.2016.1277138
- Lister, M. (2014). Trends in the design of e-learning and online learning. MERLOT Journal of Online Learning and Teaching 10(4), 671-780.
- Liguori, E. W., & Winkler, C. (2020). Adapting to online learning during the pandemic: Innovative solutions and strategies. *Educational Technology Research and Development*, 68(3), 501-518.
- Martin, F. Wang, C., Sadaf, A., Sun, T., & Westine C.D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers and Education*, 159 (1). https://doi.org/10.1016/j.compedu.2020.104009
- McGraw-Hill Education at a Glance. (2016). https://www.mheducation.com/about.html
- Mokgele, K. R., & Rothmann, S. (2014). A structural model of student well-being. *South African Journal of Psychology*, 44(4), 514-527.
- Moller, L., Foshay, W., Huett, J. (2008). The evolution of distance education: Implications for instructional design on the potential of the Web. *TechTrends*, 52 (4), 66-70.
- Montgomery, A.P., Mousavi, A., Carbonaro M., Hayward D.V., & Dunn W. (2019). Using learning analytics to explore self-regulated learning in flipped blended learning music teacher education. *British Journal of Educational Technology*, 50(1), 114-127. https://doi.org/10.1111/bjet.12590
- Ojo, A.O., Ravichander, S., Tan, C.N.-L., Anthonysamy, L. & Arasanmi, C.N. (2024). Investigating student's motivation and online learning engagement through the lens of self-determination theory. *Journal of Applied Research in Higher Education*. https://doi.org/10.1108/JARHE-09-2023-0445
- Piaget, J. (1976). The child and reality: Problems of genetic epistemology. Viking Press.
- Pöysä, S., Vasalampi, K., Muotka, J., Lerkkanen, M. K., Poikkeus, A. M., & Nurmi, J. E. (2018). Variation in situation-specific engagement among lower secondary school students. *Learning and Instruction*, *53*, 64-73.
- Prayitno, W. (2015). Implementasi Blended Learning Dalam Pembelajaran Pada Pendidikan Dasar dan Menengah. *Jurnal Pendidikan*, 6(1).
- Rajan H. M, Herbert, C., & Polly, P. (2023). Disrupted student engagement and motivation: observations from online and face-to-face university learning environments. *Frontiers in Education*, 8, 1320822. https://doi.org/10.3389/feduc.2023.1320822
- Rincon-Flores, E. G., Mena, J., & López-Camacho, E. (2022). Gamification as a teaching method to improve performance and motivation in tertiary education during COVID-19: A research study from Mexico. *Educational Sciences.* 12 (49). https://doi.org/10.3390/educsci12010049
- Ryan, R. M., & Deci, E. L. (2020). Self-determination theory: Basic psychological needs in motivation, development, and wellness. Guilford Press.
- Saekhow, J. (2015). Steps of cooperative learning on social networking by integrating instructional design based on constructivist approach. *Procedia Social and Behavioral Sciences*, 197, 1740–1744. https://doi.org/10.1016/j.sbspro.2015.07.230
- Singh V., & Thurman A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education*, 33(4), 289–306.
- Sintema, E. J. (2020). Effect of COVID-19 on the performance of grade 12 students: implications for STEM education. Eurasia Journal of Mathematics, Science and Technology Education, 16, 1-6. https://doi.org/10.29333/ejmste/7893
- Syakur, A., L. Musyarofah, S. Sulistiyaningsih, & Wike, W. (2020). The effect of project based learning (PjBL): Continuing learning innovation on learning outcomes of English in higher education. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, 3(1), 625-630.

- Tabassum, B., Moin, M., Abbas, Q., Kumbhar, M. I., & Khan, M. H. N. (2024). The impact of blended learning on student performance. *Journal of Education and Social Studies*, 5(2), 360–371. https://doi.org/10.52223/jess.2024.5217
- Tang, M., & Byrne, R. (2007). Regular versus online versus blended: A qualitative description of the advantages of the electronic modes and a quantitative evaluation. *International Journal on E-learning, 6*, (2), 257-266.
- Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.