Journal of Information Technology Education: Research

An Official Publication of the Informing Science Institute
InformingScience.org

JITEResearch.org

Volume 23, 2024

CHARTING BLENDED LEARNING IN THE SOCIAL MEDIA AGE: A BIBLIOMETRIC PERSPECTIVE AND PATHWAYS FOR FUTURE DEVELOPMENT

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ABSTRACT

Aim/Purpose	The research aims to uncover the key research themes and trends of Social Media-Enhanced Blended Learning (SMBL) research. It will extract valuable insights from scholarly publications using bibliometric analysis.
Background	Although previous scholarly works and bibliometric review papers have examined integrating social media into blended learning and its impact on teaching and learning, none of the studies has explored their convergence.
Methodology	The bibliometric review utilized a dataset of 422 scholarly papers extracted from the Scopus research database, shedding light on the performance, and evolving conceptual structure of the SMBL field.
Contribution	This study offers valuable insights into the structure and dynamics of the SMBL field, guiding future researchers and practitioners on decisions about social media technology integration in blended learning.
Findings	The extant literature on SMBL demonstrates a growing interest in harnessing the potential of social media technologies to enhance the blended learning approach. Notably, "social media," "blended learning," "flipped classroom," "tertiary education," "e-learning," "online learning," and "pandemic" emerged as the top keywords, emphasizing the central focus on leveraging social media platforms to enhance the blended learning experience.

Accepting Editor Kay Fielden | Received: September 24, 2023 | Revised: December 13, December 20, 2023; January 8, 2024 | Accepted: January 11, 2024.
Cite as: Halibas, A. S., & Thi Hoang, M. D. (2024). Charting blended learning in the social media age: A bibliometric perspective and pathways for future development. *Journal of Information Technology Education: Research, 23,* Article 3. https://doi.org/10.28945/5238

Recommendations for Researchers	Research can be extended using multiple research databases and the inclusion of other document types to capture more articles describing the SMBL field.
Future Research	Potential future trajectories of the SMBL field can be research studies about developing critical thinking skills and implementing project-based learning methodologies. We also suggest further research on the use and effectiveness of social media integration in blended learning in various educational contexts and social media platforms.
Keywords	bibliometrics, social media, blended learning, COVID-19, flipped classroom

INTRODUCTION

The education sector has witnessed a significant transformation in recent years, driven by the widespread adoption of digital technologies, the emergence of social media platforms, and the COVID-19 pandemic (Adarkwah & Huang, 2023; Haleem et al., 2022). Undeniably, the COVID-19 pandemic accelerated the adoption of online and blended learning modalities, further emphasizing the importance of digital tools, including social media, for maintaining student-teacher connections and fostering interactive learning experiences (Iivari et al., 2020; Turu et al., 2023). This shift has given rise to the use of social media in online and blended learning.

The emergence of social media-enhanced blended learning represents a significant paradigm shift in education. Social media platforms like Facebook, Twitter, and Instagram have provided new opportunities for communication, collaboration, and engagement among students, educators, and institutions (Chan & Leung, 2016). A recent report shows that 80% of college instructors use social media platforms in their instructional practices for professional communication (Eser, 2023). Similarly, 98% of higher education institutions utilize social media platforms to disseminate instructional content (Eser, 2023). University students spend a significant amount of their time on social media platforms (Mostafa, 2015). Likewise, 75% of college students use Instagram or Facebook, 60% use TikTok, 55% use Snapchat, and nearly half use Twitter (Fourtane, 2023). Students recognize the affordances of social media in their lives, both inside and outside the classroom, to enhance their educational experiences (Han, 2022). They use social media channels to access course materials, collaborate with peers, and communicate with instructors, enhancing their capacity for creativity, dynamism, and research focus (Ansari & Khan, 2020).

Numerous research studies have investigated the adaptability of social media for both formal and informal learning settings and its growing role in enhancing student engagement (Alalwan, 2022; Ansari & Khan, 2020) and academic performance (Ashraf et al., 2021). This underscores the importance of social media to education, particularly in the context of blended learning. Hence, it is imperative to consolidate the extant body of literature to identify prevalent themes, patterns, and potential inconsistencies to progress the field. A systematic review is a suitable approach to address this matter as it enables the synthesis of relevant studies, analysis of prevailing trends, and identification of research gaps within the existing body of literature. Although previous scholarly works and bibliometric review papers have examined the integration of social media into blended learning (Barrot, 2021; Yu et al., 2023) and its impact on teaching and learning (Perez et al., 2023), none of these studies have explored their convergence. Hence, the present study aims to fill this research gap by employing bibliometrics analysis to gain a comprehensive understanding of social media-enhanced blended learning (SMBL), which we define as a pedagogical approach that combines traditional face-to-face instruction with online learning, leveraging the affordances of social media to enhance educational experiences. Our main objective is to explore and identify significant research themes and trends of social media-enhanced blended (SMBL) literature to advance the field. Specifically, we seek to answer the following questions:

- What are the performance outcomes of publications, and how have these outcomes influenced the SMBL field?
- What are the key themes and trends in the SMBL field?
- What emerging trends, gaps, or opportunities inform future research directions and priorities within the SMBL field?

This bibliometric review utilized a dataset of 422 scholarly papers extracted from the Scopus research database, shedding light on the publication performance, and evolving conceptual structure of the SMBL field. The study revealed that the field has experienced significant growth and diversification over the decade, reflecting the increasing importance of social media technology-mediated education. The analysis identified several prominent themes and conceptual clusters within this field. This study offers valuable insights into the structure and dynamics of this evolving field, guiding future researchers and practitioners on decisions about social media technology integration in teaching and learning.

We have organized our paper into five distinct sections. We begin by laying a conceptual foundation in the literature review section, discussing blended learning approaches and models, social media in education, blending learning and social media review research, and bibliometrics. The research methodology section follows, where we systematically outline the research methodology, providing transparency into how we conducted our study. Moving on to the bibliometric analysis, results, and discussions, we present the focus of our research, featuring a comprehensive bibliometric analysis. Within this section, we showcase the results and discuss the conceptual mapping of the SMBL field. Lastly, the conclusion, future directions, and limitations sections bring our study to a thoughtful conclusion, summarizing the theoretical contributions, identifying potential future research directions, and acknowledging the limitations inherent in our study.

LITERATURE REVIEW

This section discusses the relevant concepts of this study, including blended learning, social media, and bibliometric review. It also provides seminal systematic and bibliometric review studies. This section sets the stage for a comprehensive examination of the SMBL field.

BLENDED LEARNING APPROACHES AND MODELS

Blended learning is an instructional approach that combines traditional face-to-face teaching with online learning components, aiming to provide a more flexible and effective educational experience (Graham, 2006). This approach allows students to engage with course content and activities in a physical classroom and online. Blended learning is often designed to leverage the strengths of both in-person and online instruction, catering to diverse learning styles and needs.

Blended learning models have evolved in response to the integration of social media. Common models include the flipped classroom, rotational, and flex models. In a flipped or inverted classroom setting, students engage with course content online before attending face-to-face classes, allowing class time to be dedicated to active learning and discussions (Fung et al., 2021). The rotation model enables students to rotate between different learning stations, including face-to-face instruction, online activities, and independent work, providing flexibility in how students engage with content (Horn & Staker, 2011). Meanwhile, the flex model allows students to primarily learn online, having control over the pace and location of their learning and meeting with instructors for additional support, clarification, or assessment as needed (Horn & Staker, 2011). These models leverage social media platforms to facilitate online discussions, content delivery, and collaborative activities.

SOCIAL MEDIA IN EDUCATION

Social media enables blended learning and has become integral to the learning experience (Adarkwah & Huang, 2023). Numerous social media platforms, including Facebook, Twitter, Instagram, and discussion forums, have been integrated into education. The integration of these social media has the

potential to enhance communication, collaboration, engagement, and motivation among students and educators (Junco et al., 2011; Manca & Ranieri, 2016a; Platonova et al., 2022; Romadhon et al., 2019).

Blended learning using social media provides opportunities for more accessible and inclusive education. Social media platforms facilitate real-time interaction, collaborative learning, and access to a wealth of informal educational resources, offering convenience, social presence, and personalized learning (Kaplan & Haenlein, 2010; Romadhon et al., 2019). The use of these platforms necessitates the development of digital literacy skills (Prensky, 2001) and ethical considerations related to responsible online behavior and academic integrity (Roblyer et al., 2010). Staying updated on how social media is used for education is essential for educators and academic institutions, ensuring they adapt to changing technologies and student preferences.

Social Media and Blended Learning Review Research

While numerous systematic literature reviews have been conducted to synthesize the findings and insights from research on blended learning (Albeta et al., 2023; Bozkurt, 2022; Raman et al., 2021), there is still a scarcity of studies that employ bibliometric approaches to quantitatively analyze the conceptual structure these fields (Tonbuloğlu & Tonbuloğlu, 2023).

For instance, the bibliometric study of Tonbuloğlu and Tonbuloğlu (2023) indicates that social media is a key focus area of blended learning research. The study used a bibliometric approach to analyze the five decades of trends and patterns in blended learning research. Although it highlights the growing importance of blended learning driven by technological advancements and the evolving educational environment, it fails to address the influence of social media on blended learning. Similarly, Yu et al. (2023) performed a bibliometric analysis examining the utilization of social media within an educational context spanning four decades. While their goal was to explore the incorporation of social media in education and its potential influence on educational outcomes, it did not probe into the specific application of social media within the context of blended learning. Despite these valuable systematic reviews, a bibliometric analysis of the SMBL remains noticeably absent, leaving unexplored questions about the growth, impact, and interconnectedness of research in social media and blended learning. Exploring this intersection is of considerable significance in today's educational environment. Integrating technology, including social media platforms, has become increasingly prevalent as educational practices evolve.

Bibliometrics for Understanding Social Media and Blended Learning Research

The significance of social media in education has prompted extensive research efforts to understand its impact, applications, and potential benefits in blended learning. To understand this evolving field comprehensively, researchers have turned to bibliometrics and systematic literature reviews as valuable tools for assessing the scope, trends, and depth of existing scholarship.

Bibliometrics, a quantitative research method that analyzes scholarly publications, provides a systematic means of understanding the research landscape related to social media-integrated blended learning in education. Bibliometric studies examine various aspects, including publication patterns, citation networks, authorship, and keyword trends (Cruz-Cárdenas et al., 2023). Such analyses allow us to identify influential works, prolific authors, and emerging research themes (Raman et al., 2021).

Our study uses Bibliometrics to understand how much research has been conducted in this area, the growth of publications over time, and which papers and topics within the SMBL field have received the most attention. We also use it to measure the progress and impact of social media integration in blended learning over time, assessing whether the field is evolving and making a difference in educational practices. Furthermore, we use it to identify research gaps, guiding future research efforts. Like many research studies, we used Biblioshiny to perform our bibliometric analysis (Ha et al., 2020; Zhao et al., 2022).

RESEARCH METHODOLOGY

This section provides the research methodology employed for our bibliometric study. The methodology draws upon the work of Donthu et al. (2021), which provides a framework guiding the systematic analysis of scholarly literature within the SMBL field. By rigorously following established bibliometric techniques, we aim to uncover valuable insights into the patterns, trends, and relationships within the academic literature relevant to our research questions. This section describes our data collection process, the selection criteria for articles, and the various bibliometric analyses and tools utilized. It explains the steps taken to identify key authors, influential publications, and emerging research themes, enabling a comprehensive understanding of the knowledge structure in the SMBL field (see Figure 1).

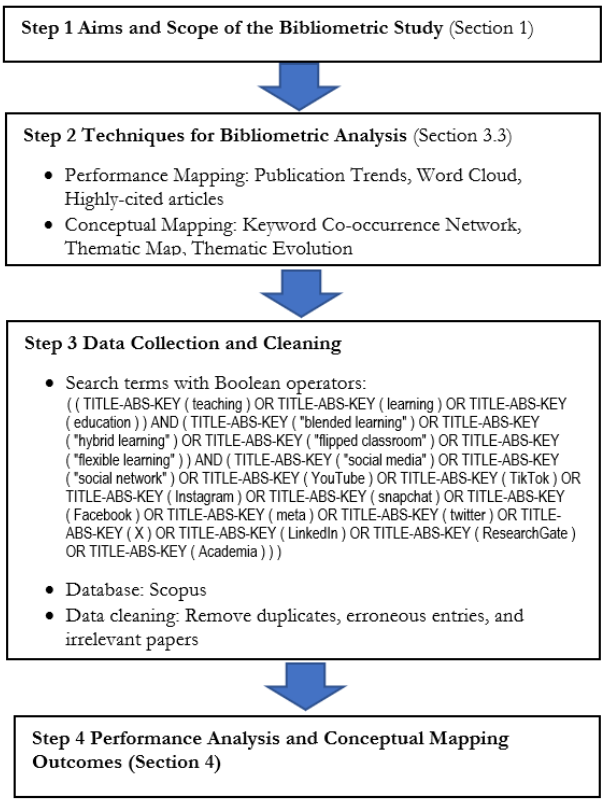

Figure 1. Bibliometric and search protocol used in this study

We employed a rigorous search strategy to provide a comprehensive foundation for the bibliometric analysis. We conducted the publication search using the Scopus database due to its extensive coverage, multidisciplinary content, citation data, advanced search and filtering options, integration with bibliometric tools, accessibility, and reliability (Brzezinski, 2015; Elsevier, 2022). Keywords and phrases such as "blended learning," "hybrid learning," "flipped classroom," "flexible learning," "education," "teaching," "learning," "social media," "social network," "YouTube," "TikTok," "Instagram," "Facebook," "Meta," "Snapchat," "Twitter," "X," "Academia," and "ResearchGate" were used to identify scholarly publications (Howe et al., 2014) (see Appendix). Likewise, combinations of Boolean operators (AND, OR) were strategically used to refine the search results and capture a diverse range of literature in the research area (Fink, 2014). This guarantees reproducibility of the selection phase (Schumann et al., 2020). The choice of social media applications included in this study was taken from various educational websites (MMS Education, n.d.; West, 2021). We set the date range from 2008 to August 2023, spanning 15 years of publication in the research area. Scopus returned a total of 1,298 articles. We restricted the search to published journal articles, excluding review papers,

conference papers, editorials, short surveys, and research notes, to ensure the utilization of more reliable and authoritative sources of information (Rojas-Sánchez et al., 2023). Hence, the list was further reduced to 621 articles. Next, we limited the language to English to make our research more accessible to researchers globally. This process resulted in an initial list comprising 583 articles. We performed a thorough manual review of the list using Microsoft Excel. First, duplicate papers were systematically identified and removed to avoid redundancy in the analysis. Second, the researchers examined each paper in the list to identify and exclude studies irrelevant to the research questions. Third, we excluded systematic literature review papers incorrectly added to the list. These steps were crucial for maintaining the integrity of the analysis. Once the dataset was cleaned and refined, the finalized list of research papers was uploaded to a bibliometric analysis tool, Biblioshiny, to conduct in-depth bibliometric analyses and generate meaningful insights into the research field. The final list consists of 422 articles.

BIBLIOMETRIC ANALYSIS, RESULTS, AND DISCUSSIONS

This section highlights the key findings and contributions of bibliometric studies within the SMBL field.

PERFORMANCE ANALYSIS

The performance analysis of the bibliometric review was conducted to assess the key outcomes and trends in the selected literature corpus. It highlights the key contributors and publications in social media and blended learning research. The bibliometric review covered a period from 2008 to 2023, encompassing 15 years of research in social media and blended learning. A total of 275 unique journals were identified, indicating the diverse academic sources contributing to the discourse on this topic. These journals collectively yielded 422 articles, with an annual growth rate averaging 27.88% (Figure 2), underscoring the sustained scholarly interest in this research area. The corpus comprised 1,274 author keywords, showcasing the rich and multifaceted nature of research themes within the field.

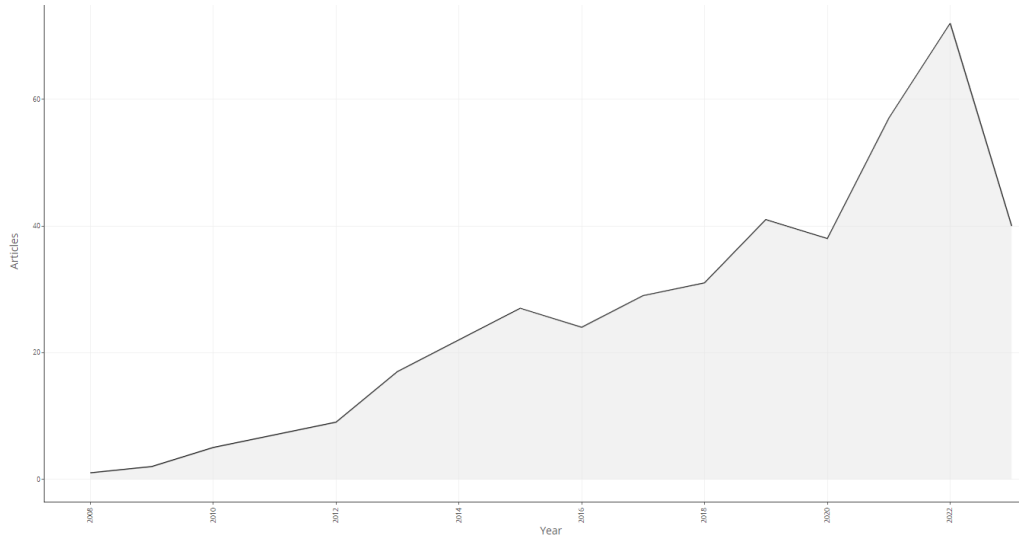

Figure 2. Annual publication growth rate of the SMBL literature

The bibliometric analysis further revealed that the research community involved 1,260 unique authors, reflecting a broad and collaborative network of scholars engaged in this field. Notably, a substantial portion of authors, 92 (7.3%), contributed single-authored documents, signifying their independent research contributions and expertise. These findings highlight the expansive and evolving

nature of research on social media and blended learning and emphasize the importance of collaborative efforts and individual contributions in advancing the field's understanding and impact.

The word cloud analysis (Figure 3) revealed the insights from the corpus of research articles in the SMBL field. The visual representation highlighted a cluster of prominent keywords that underscored this field's key themes and trends. Notably, "social media," "blended learning," "flipped classroom," "tertiary education," "e-learning," "online learning," and "pandemic" emerged as the top keywords, emphasizing the central focus on leveraging social media platforms to enhance the blended learning experience. Collectively, these keywords signify the research community's keen interest in exploring the integration of social media tools within traditional educational frameworks to foster interactive and collaborative learning environments. Additionally, terms such as "pedagogy," "technology," "collaborative learning," "active learning," and "student engagement" were prominent, indicating a focus on pedagogical approaches. Similarly, terms such as "technology," "learning analytics," "learning management system," "gamification," "mobile learning," "Facebook," and "YouTube" were also prominent, suggesting a strong emphasis on technological innovations. The word cloud analysis provides a visual snapshot of the research environment and highlights the key thematic areas and research priorities within the social media-enhanced blended learning field.

Figure 3. Word cloud of themes in the SMBL field

Table 1. Top 10 globally cited articles

Authors	Article Title	Citation
(Shih, 2011)	Can Web 2.0 technology assist college students in learning English writing? Integrating Facebook and peer assessment with blended learning	217
(Barry et al., 2016)	Anatomy education for the YouTube generation	185
(Joshua McCarthy, 2010)	Blended learning environments: Using social networking sites to enhance the first-year experience	184
(Lapitan et al., 2021)	An effective blended online teaching and learning strategy during the COVID-19 pandemic	181
(Manca & Ranieri, 2016b)	"Yes for sharing, no for teaching!": Social Media in academic practices	157
(Brahimi & Sarirete, 2015)	Learning outside the classroom through MOOCs	133
(Murillo-Zamorano et al., 2019)	How the flipped classroom affects knowledge, skills, and engagement in higher education: Effects on students' satisfaction	132
(Yilmaz, 2016)	Knowledge sharing behaviors in e-learning community: Exploring the role of academic self-efficacy and sense of community	108
(Lo et al., 2018)	Applying "First Principles of Instruction" as a design theory of the flipped classroom: Findings from a collective study of four secondary school subjects	105
(Lin & Hwang, 2018)	A learning analytics approach to investigating factors affecting EFL students' oral performance in a flipped classroom	102

Influential seminal works influence the SMBL research. Topping the list in Table 1 is Shih's (2011) paper, with 217 citations, which examines the impact of integrating Facebook and peer assessment into college-level English writing class instruction using a blended teaching approach. Following closely is the work of Barry et al. (2016), accumulating 185 citations, which sought to understand how integrating social media into anatomy education can adapt to the learning styles and habits of Gen C (Generation Connected) students. The work of McCarthy (2010), in the third position with 184 citations, explored integrating virtual and physical learning environments to enhance the first-year university experience. These top-cited works and seven others in the table collectively reflect the foundational knowledge and pioneering studies in the SMBL field.

Conceptual Analysis

The following sections provide visual representations of the conceptual knowledge structure of the SMBL field, showing the relationships between different author keywords.

Research Themes in the SMBL field

Figure 4 visually represents the keyword co-occurrence network within the SMBL field. This network consists of six distinct thematic clusters and 67 keywords distributed across them. Each cluster represents a unique research focus or theme within the field, and the connections between keywords illustrate their co-occurrence patterns, shedding light on the interrelatedness of topics within the research field.

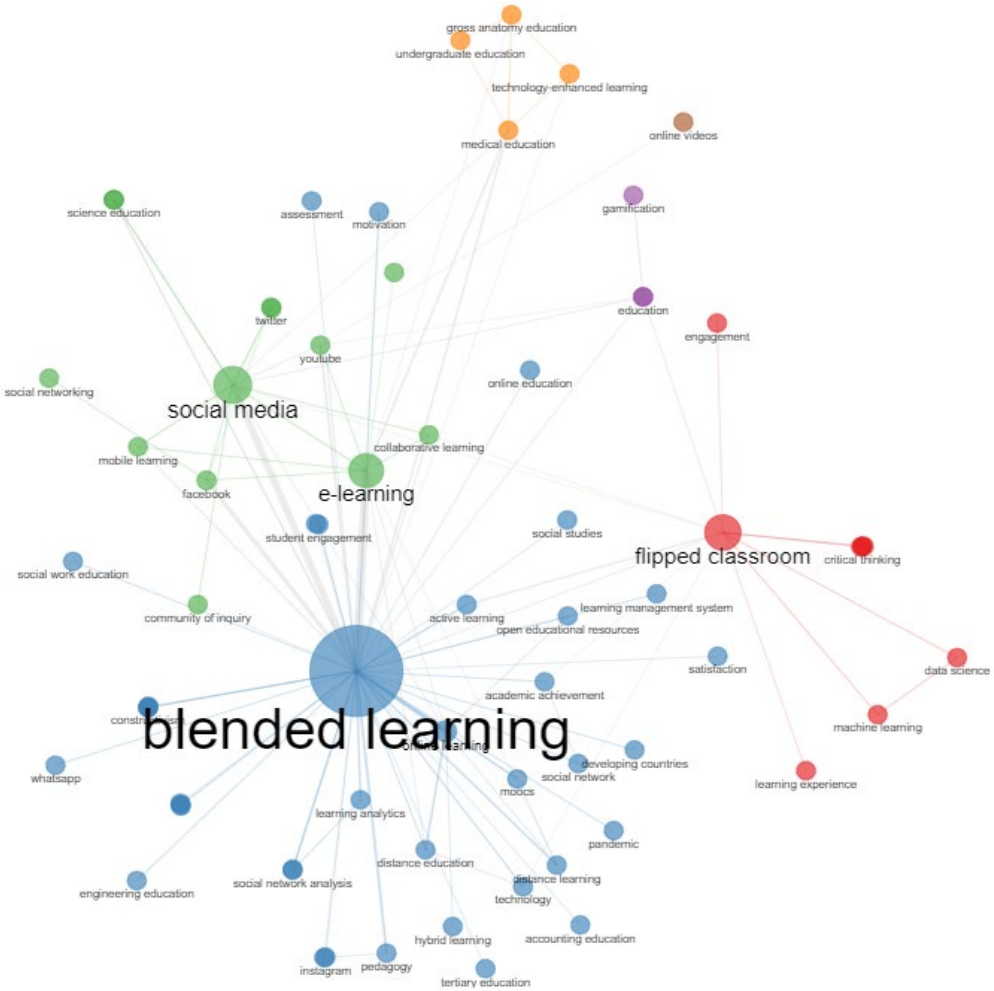

Figure 4. Keyword co-occurrence network of the SMBL field

Cluster 1: Innovative Pedagogy and Technology Integration. This cluster primarily focuses on pedagogical and technological aspects of education. "Flipped classroom" indicates a research interest in innovative teaching approaches. "Engagement" and "critical thinking" suggest that researchers are exploring ways to enhance student participation and critical thought in social media-enhanced blended learning environments. "Machine learning" and "data science" point to the adoption of advanced analytics and artificial intelligence in education. Collectively, these topics represent the foundation of research studies aiming to improve learning experiences and outcomes through technology and innovative teaching methods.

Cluster 2: Blended Learning and Educational Technology. This extensive cluster reflects the broad spectrum of social media-enhanced blended learning research themes. "Blended learning," "online learning," and "learning management systems" highlight a core focus on technology integration in education. "Pandemic" indicates a timely emphasis on how educational practices adapted during the COVID-19 pandemic, with a particular interest in "distance education" and "hybrid learning." "Social network analysis" and "learning analytics" demonstrate a growing trend towards data-driven research to improve teaching and learning in a social learning environment. Topics like "motivation," "constructivism," and "satisfaction" underscore the significance of pedagogical theories and student engagement in research studies.

Cluster 3: Social Media and Online Learning Communities. This cluster is centered around "e-learning" and "social media," showcasing the intersection of technology and social interaction in education. "Facebook," "mobile learning," and "Twitter" suggest research on leveraging social media platforms for educational purposes. "Community of inquiry" and "social networking" emphasize the creation of supportive online learning communities. Including "science education" and "pronunciation" highlights specialized applications of social media-enhanced learning in specific fields.

Cluster 4: Gamification and Broad Educational Concepts. Cluster 4 deals with broader educational concepts. "Education" encompasses various aspects of the educational field, and "gamification" represents research incorporating game elements in teaching and learning. "Training" may pertain to corporate or professional training contexts, where gamification and social media technology play crucial roles in enhancing engagement and knowledge transfer.

Cluster 5: Medical Education and Technology Integration. This cluster is dedicated to "medical education" and "technology-enhanced learning" in the medical field. It signifies research studies aimed at enhancing medical education through social media technology, which is especially important given the complex nature of medical training. "Gross anatomy education" and "undergraduate education" represent specific areas of focus within medical education research, indicating how social media technology and blended learning approaches can be tailored to meet the unique needs of medical students.

Cluster 6: Video-Based Learning. This concise cluster centers on "online videos," indicating research related to the use of video content in education (e.g., YouTube). It explores the effectiveness of video-based instruction, strategies for creating engaging video content, and the impact of videos on student learning outcomes.

Thematic Map in the SMBL Field

The thematic map in Figure 5 provides an overview of the themes that define the SMBL research field. Throughout our analysis, we use the Walktrap clustering algorithm and set the number of words to 250 and a minimum cluster frequency of five. The thematic map shows 45 research themes with 146 keywords, describing the significant research topics within the field.

Figure 5. Thematic map of the SMBL field

The *basic theme* comprised eight representative clusters: "blended learning," "collaborative learning," "technology," "online education," "pedagogy," "education," "flexible learning," and "tertiary education". Blended learning, the biggest cluster, is the central theme, comprising various teaching modalities. Pedagogical principles guide blended learning, incorporate technology and online education (Brahimi & Sarirete, 2015), and often emphasize collaborative and flexible learning (McCarthy, 2017; Seo et al., 2018). It is especially relevant in tertiary education, which can enhance the overall educational experience (Manca & Ranieri, 2016b). This reflects the holistic approach to education that SMBL aims to achieve, leveraging the strengths of both in-person and online learning while considering the role of social media technology and pedagogy.

The *motor theme* comprised 12 loosely connected representative clusters: "remote learning," "evaluation," "academia," "constructivism," "community of inquiry," "medical education," "collaboration," "student-centered learning," "content analysis," "teachers," "autonomous learning," and "English for specific purposes." Remote learning is the bridge between traditional and online education, usually utilized in resource-constrained learning environments (Rwodzi & De Jager, 2021), while evaluation ensures the continuous improvement of blended learning strategies. The academia cluster provides the context for implementing and researching these approaches, guided by pedagogical theories like constructivism and community of inquiry (Al-Dheleai et al., 2020; Anders, 2015). The prominence of the medical education cluster underscores its specialized application within this motor theme (Barry et al., 2016), illustrating how SMBL principles can be adapted to address the unique needs of medical training. This theme reflects the dynamic nature of the SMBL field as it evolves within different educational contexts.

The *niche theme* comprised 19 overlapping representative clusters: "perceived anxiety," "improving classroom teaching," "social work education," "WhatsApp," "participation," "knowledge sharing," "meta-cognition," "activity theory," "student experiences," "academic performance," "English as a foreign language," "simulations," "Australia," "case-based learning," "case study," "communication," "learning communities," "networked learning," and "quantitative study." These topics are driven by a shared focus on enhancing the educational experience, particularly within social work education and other specialized fields (Knowles & Cooner, 2016). Researchers examine how perceived anxiety levels among students and instructors can be managed or reduced through innovative teaching practices (Alyoussef, 2022), including integrating social media-enhanced blended learning.

The *emerging theme* comprised six (6) overlapping representative clusters: "critical thinking," "project-based learning," "machine learning," "Edmodo," "adoption," and "students." These topics are driven by the advances in educational practices through innovation and technology. Critical thinking and project-based learning leverage social media and blended learning to foster active, collaborative, and inquiry-based learning (Boa et al., 2018; Canaleta et al., 2014). Machine learning can enhance the personalization and effectiveness of these approaches by analyzing student data and adapting learning activities (Salas-Rueda, 2022). Edmodo is an emerging platform that aligns with the broader trend of utilizing specialized educational technologies to create more interactive and engaging learning environments (Chin et al., 2018). Some topics in the emerging theme can represent the future direction in the SMBL research field, particularly critical thinking and project-based learning.

Thematic Evolution in the SMBL Field

Figure 6 visually represents the thematic evolution within the SMBL field from 2008 to the present. The map illustrates the progression of thematic topics within the educational environment, tracing their development through three separate periods: pre-pandemic (2008-2019), during the Covid-19 pandemic (2020-2022), and post-pandemic (2023). Through analyzing the thematic patterns over time, this map provides significant insights into how educators, researchers, and the broader education community have adjusted to the changing complexities and innovation possibilities, such as integrating social media within a blended learning environment.

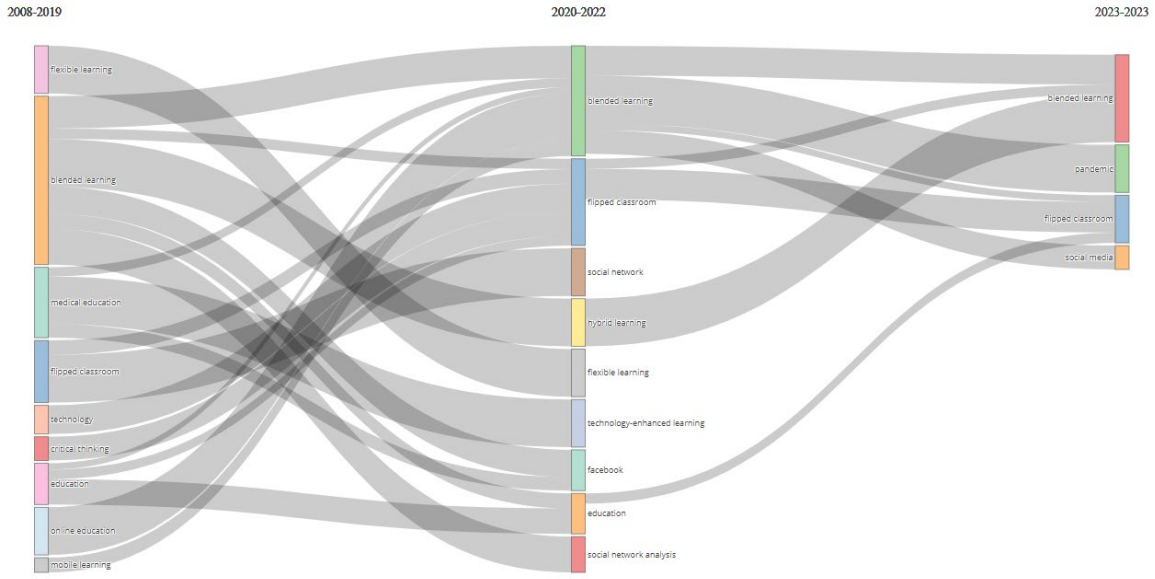

Figure 6. Thematic research evolution of the SMBL field

Pre-pandemic research publications in the SMBL field. This period comprised 215 papers with representative themes such as "flexible learning," "blended learning," "medical education," "flipped classroom," "technology," "critical thinking," "education," "online education," and "mobile learning." The flexible learning and blended learning themes suggest that educators and researchers were already exploring ways to make learning more adaptable and responsive to students' needs. For instance, the findings of Shih (2013) suggest that integrating Facebook into the course effectively enhances students' learning of business communication English. Similarly, Sari and Wahyudin (2019) found that most students had a highly positive perception of using Instagram for learning, as it positively influenced their motivation, engagement, and attitudes. Similarly, flexible learning encompassed various modalities, including blended and online learning. The presence of a flipped classroom highlights the popularity of the flipped classroom model, where online learning resources complement traditional in-class activities. This suggests that educators and researchers were experimenting with innovative pedagogical approaches using innovative technologies and social media (Bozanta & Mardikyan, 2017). Research about online education and mobile learning themes underlines the growing importance of online and mobile social media technologies in education (Lim, 2010). Likewise, the inclusion of medical education suggests a specialization within the field, indicating that social media-enhanced blended learning was being applied to healthcare education. A study by Barry et al. (2016) discovered that most second-year undergraduate medical and radiation therapy students use online platforms, primarily YouTube, for anatomy-related learning, suggesting potential benefits in incorporating social media into anatomy programs to engage this generation of students. The critical thinking theme suggests that educators and educators were using technology and exploring how to foster higher-order thinking skills in blended learning environments (Boa et al., 2018).

COVID-19 publications in the SMBL field. Although this period spans only two years, it is comprised of 167 papers having representative themes such as "blended learning," "flipped classroom, "social network," "hybrid learning," "flexible learning," "technology-enhanced learning," "Facebook," "education," and "social network analysis." Blended learning, flexible learning, and flipped classrooms indicate a continuous research interest toward more flexible, adaptive, and hybrid models that combine traditional classroom learning with online learning affordances. The inclusion of the social network theme suggests research interest in exploring the role of social media platforms in education and how they can facilitate learning and collaboration. The social network analysis theme

suggests a growing research interest in analyzing social interactions within online learning environments to improve engagement and outcomes (Ellis et al., 2021). The mention of Facebook highlights the specific research interest in this social media platform as a tool for educational purposes (Datko, 2021). Furthermore, the technology-enhanced learning theme emphasizes integrating technology into educational practices, especially during the pandemic (Silalahi et al., 2022).

Post-pandemic publications in the SMBL field. This period, which comprised 40 papers, includes representative themes such as "blended learning," "pandemic," "flipped classroom," and "social media." The continued presence of blended learning and flipped classroom themes indicate its enduring popularity as a pedagogical approach. The inclusion of a pandemic theme likely reflects the profound impact of the COVID-19 pandemic on education. It suggests that educators and researchers are still examining the role of social media-enhanced blended learning approaches in response to global disruptions in learning environments (Turu et al., 2023). While social media was not explicitly stated in the previous periods, its mention in this period suggests an increasing research focus on the SMBL field, influenced by shifts in pedagogical paradigms (Biberman-Shalev et al., 2023) and improvement of academic outcomes and student engagement (Shafiq & Parveen, 2023).

CONCLUSION, FUTURE DIRECTIONS, AND LIMITATIONS

CONCLUSION

The literature on SMBL demonstrates a growing interest in harnessing the potential of social media technologies to enhance the blended learning approach. The bibliometric review covered a period from 2008 to 2023, encompassing 15 years of research in social media and blended learning. A total of 275 unique journals were identified, indicating the diverse academic sources contributing to the discourse on this topic. These journals collectively yielded 422 articles, with an annual growth rate averaging 27.88%, underscoring the sustained scholarly interest in this research area. The corpus comprised 1,274 author keywords, showcasing the rich and multifaceted nature of research themes within the field. The bibliometric analysis further revealed that the research community involved 1,260 unique authors, reflecting a broad and collaborative network of scholars engaged in this field. Notably, a substantial portion of authors, 92(7.3%), contributed single-authored documents, signifying their independent research contributions and expertise.

The word cloud analysis revealed insights from the corpus of research articles in the SMBL field. Notably, "social media," "blended learning," "flipped classroom," "tertiary education," "e-learning," "online learning," and "pandemic" emerged as the top keywords, emphasizing the central focus on leveraging social media platforms to enhance the blended learning experience. Moreover, the SMBL research is influenced by influential seminal works. Topping the list is Shih's (2011) paper, with 217 citations, which examines the impact of integrating Facebook and peer assessment into college-level English writing class instruction using a blended teaching approach.

The keyword co-occurrence network offered insights into the prevailing trends, key areas of interest, and the evolving dynamics of social media integration in blended learning. It revealed six distinct thematic clusters and 67 keywords distributed across them. Cluster 1 focused on various pedagogical and technological aspects of education. Cluster 2, the largest and most diverse cluster, covers various themes related to blended learning and social mobile education technology. Cluster 3 is centered around the intersection of technology and social interaction in education. Cluster 4 concentrates on broader educational concepts and gamification. Cluster 5 uses technology to enhance medical schools' teaching and learning experiences. Cluster 6 is relatively concise, focusing on online videos as a teaching and learning tool.

The thematic map revealed basic, motor, niche, and emerging themes. The basic theme comprises eight clusters, with blended learning as the overarching theme. The motor theme shows the medical education cluster, illustrating how an SMBL approach caters to the needs of medical education. The

niche theme offers a broad understanding of the SMBL field in various applications and contexts. The emerging theme highlights potential future trajectories of the SMBL field, especially in developing critical thinking skills and implementing project-based learning methodologies.

The thematic evolution shows that blended learning and its various forms, such as flipped classroom, hybrid, and remote learning, have garnered significant interest from researchers even before the pandemic, as substantiated by the abundance of publications during this period. During the period following the pandemic, there has been a sustained focus on the integration of social media in blended learning and the impact of the pandemic on education, suggesting that educators are examining the effects of global disruptions to teaching and learning and are turning to social media to modify their pedagogical practices. In addition, the prevalent social media platforms used were Facebook, YouTube, Instagram, Whatsapp, and Edmodo. The use of social media platforms, particularly Facebook, in blended learning had a surge in popularity during the pandemic. Overall, the thematic evolution highlights the adaptability and responsiveness of the SMBL field to the changing educational environment and emerging technologies. It also underscores the ongoing relevance of pedagogical approaches like blended learning and the need to incorporate digital tools and strategies to enhance it. The COVID-19 pandemic has accelerated online and blended learning integration, making it even more critical to understand how social media approaches can be effectively implemented.

Future Directions

The motor theme solely highlighted the presence of SMBL in medical education. We suggest further research on the use and effectiveness of social media integration in blended learning for various educational contexts beyond medical education. The ultimate goal is to improve blended learning outcomes while addressing the unique challenges and needs of specific educational contexts. We also consider critical thinking and project-based learning as promising topics because they align with the evolving needs of SMBL research, examining how technology and innovative pedagogies play a central role in enhancing student engagement, critical thinking, and learning outcomes.

We also noticed that Facebook is the primarily used social media platform in blended learning research. The evolving nature of social media and technology necessitates ongoing research to stay abreast of emerging platforms, tools, and pedagogical strategies. For instance, TikTok is a popular platform that could be explored in the context of blended learning. In essence, educational technology and blended learning are dynamic, and researchers should adapt to and study the evolving landscape of social media and technology for blended learning.

Social media platforms have shown potential for facilitating remote learning and engagement, making them valuable tools during disruption. Research in this area can help educators and institutions better understand how to effectively use social media in blended learning to maintain educational continuity, engagement, and quality, even in challenging circumstances like the COVID-19 pandemic.

Limitations

While this study provides valuable insights into the research area, it is not without its limitations. First, the analysis is based primarily on English-language journal articles, which may introduce language bias, potentially excluding valuable insights from non-English sources. Second, the time frame for data collection was limited to the past two decades, which may omit relevant historical context and earlier foundational research. Third, although efforts were made to include diverse sources, the focus on journal articles may have excluded relevant non-journal publications. Fourth, Scopus might not always capture early online publications to the same extent as other databases. Thus, combining multiple databases (i.e., Web of Science, Google Scholar) can enhance the comprehensiveness of the review. Future research could address these limitations by incorporating non-English papers, extending the time range, broadening the scope to encompass a more comprehensive array of scholarly outputs, and combining other research databases.

Declaration of Interest

The authors declare that they have no conflicts of interest related to the research presented in this paper.

Funding Statement

This research received no external funding.

Ethics Approval Statement

This study did not involve human subjects, so no ethical approval was required.

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APPENDIX: ADVANCED SEARCH TERMS

((TITLE-ABS-KEY (teaching) OR TITLE-ABS-KEY (learning) OR TITLE-ABS-KEY (education)) AND (TITLE-ABS-KEY ("blended learning") OR TITLE-ABS-KEY ("hybrid learning") OR TITLE-ABS-KEY ("flipped classroom") OR TITLE-ABS-KEY ("flexible learning")) AND (TITLE-ABS-KEY ("social media") OR TITLE-ABS-KEY ("social network") OR TITLE-ABS-KEY (YouTube) OR TITLE-ABS-KEY (TikTok) OR TITLE-ABS-KEY (Instagram) OR TITLE-ABS-KEY (snapchat) OR TITLE-ABS-KEY (Facebook) OR TITLE-ABS-KEY (meta) OR TITLE-ABS-KEY (twitter) OR TITLE-ABS-KEY (X) OR TITLE-ABS-KEY (LinkedIn) OR TITLE-ABS-KEY (ResearchGate) OR TITLE-ABS-KEY (Academia)))

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