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Review Article

Use of Digital Platforms Among University Students: A Systematic Literature Review

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Digital platforms have a high potential for supporting learning processes, especially in higher education. However, there appears to be a limited systematic review of research on the application of digital platforms in higher education. Using a systematic approach, this study analyzes previous research on digital platforms and how these technologies assist university students in their studies and the challenges involved. Examining 76 relevant articles from Scopus, Emerald Insight and ProQuest databases, the findings demonstrate that students' personal development could be accelerated by the practical application of technology through digital learning platforms. Furthermore, by utilizing digital channels, the COVID-19 epidemic has highlighted how crucial strategic management and flexibility are to the higher education sector. The study identified two main themes: digital platforms that support students' learning and challenges associated with the deployment of digital platforms. Various unexplored areas on the use of digital platforms among university students are highlighted in the study. The review further recommends higher education institutions to offer digital literacy programs that educate students and faculty on using digital platforms, online privacy and data protection.

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1. Introduction

Digital platforms are now ubiquitous because of increased use of Internet in every aspect of our lives. It is difficult to foresee a near future without a variety of platforms that support social, cultural, educational, political, and economic interactions considering state and corporate investments in digital infrastructure (Punathambekar & Mohan, 2019). In general, digital platforms are becoming more important in fields such as innovation, social networking, education, and employment (Koskinen et al., 2019). Prior research has defined and conceptualized digital platforms based on different views. According to Valencia et al. (2017), digital platforms as defined in this study refers to educational tools that improve learning processes and offer a set of tools that enable synchronous and asynchronous interaction and communication between students and between the teacher and his students.

Becker et al. (2017) indicate that the discussion surrounding teaching and learning in higher education is heavily influenced by digital technologies because of the seemingly endless opportunities these platforms present, such as Massive Open Online Courses (MOOCs). There are many different digital platforms that can be employed in education to create a flexible and

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dependable learning environment. Turnbull et al. (2020) identify them as Blackboard, Moodle, Canvas, Edmodo, and Google Classroom. According to Bullen and Morgan (2015), digital platforms like Zoom, YouTube, Google Meet, WhatsApp, and Microsoft Teams have had a big impact on students and institutions alike, changing the way they interact with knowledge, information, and study techniques. From an educational perspective, digital platforms contain a set of tools such as videos, discussion fora, chat fora, assignments and quizzes that support students learning (Simanullang & Rajagukguk, 2020). Digital learning platforms do not significantly differ from traditional face-to-face classroom interactions. Even though digital platforms have become an integral part of modern education, offering numerous benefits such as accessibility, flexibility, and a wealth of resources, there are also several challenges that are associated with its usage. While it may seem obvious that university students use digital platforms, Balzotti & McCool (2016) contend that this does not permit spontaneity or the real-time exchange of ideas. Singh (2021) asserts that students who lack desire, self-assurance, and self-regulated learning skills have several difficulties when using digital platforms. The study by Dalipi et al. (2022) about the transition to online teaching and learning also identified similar issues. These difficulties include lack of technology, affective support, financial limitations, and restricted access to the internet. Comparably, Demsash et al. (2023) point out that policies and a lack of human resources are obstacles to the adoption of digital technology in educational settings. To guarantee that every student benefits equally, it is imperative to eliminate these obstacles and constraints. Subsequently, Kraleva et al. (2019) aver that teachers and students can tackle problems that arise throughout the learning process by exchanging ideas and information through digital platforms.

Gomes and Lopes (2022) classify digital educational platforms into five types. These consist of planning, management, learning, cooperation, and communication. Timetables are scheduled and managed using digital planning platforms, which have capabilities like shared agendas and calendars. Digital management tools facilitate group formation, classroom personalization, online activity monitoring, and registration. Links, access codes, and online tests are the primary resources for these platforms. Multimedia pedagogical materials such as interactive lessons, content pages, tests, glossaries, audio and video files, quizzes, linkages, and indexes are created by digital learning platforms. Digital platforms for cooperation facilitate group activities, as well as resource sharing and collective production. Wiki tools, file sharing, and blogging are the most common examples. Digital communication systems are made to provide information about upcoming classes, facilitate synchronous and asynchronous contact, monitor pedagogy, and encourage and supervise activities. This kind of digital platform mostly uses messages, chats, forums, classes, and surveys as its instruments.

Digital platforms have high potential for supporting learning processes. However, existing studies focus on the use of digital platforms among governmental organizations (Falco & Kleinhans, 2018; Johnson et al., 2021; Rolland et al., 2018), development (Bonina et al., 2021; Moura & Gomes, 2020), culture (Calvo, 2022; Pesce et al., 2019), and business (Lee et al., 2022; Park et al., 2021; Ratten, 2022). Within this new corresponding literature, application-specific analysis of articles that focus on utilizing digital platforms is available (Choo et al., 2022; Khomo et al., 2023). Utilizing digital tools to enhance education among university students is a field of educational research that is crucial in communication education and scholarship. Nevertheless, studies conducted so far are rather dated with little or no systematic literature reviews (Sambamurthy & Zmud, 2000; Tiwana & Ramesh, 2001).

This systematic literature review (SLR) aims to interrogate both academic and professional literature on utilizing digital platforms among university students by delving into digital platforms' technological affordances to support teaching and learning, challenges that institutions face and gaps that future research can fill. SLR was deemed the most appropriate type of review to meet the objectives of this study, as it enables exploring comprehensively the breadth of existing research to map the literature and provide directions for future research (Pollock & Berge, 2018).The SLR will address the following research questions (RQs):

- **RQ 1.** What are digital platforms' technological affordances to support teaching and learning in the most effective, efficient and appealing way?
- **RQ2.** What are the challenges associated with the deployment of digital platforms in higher education?
- **RQ3.** What gaps exist in the current literature on use of digital platforms among university students that future research can address?

2. Methodology

This work used SLR to find and compile existing literature using transparent, well-organized, and

repeatable procedures that incorporate pre-established search terms, inclusion and exclusion criteria (Higgins et al., 2019). Because this method is based on already-published data, researchers can use it to pinpoint knowledge gaps and suggest new lines of inquiry (Danso et al., 2023; de-Lima-Santos, 2023). As a result, published and peer-reviewed publications in this field of study have been descriptively categorized using qualitative methods of pattern matching and explanation building (Bhimani et al., 2019).

2.1. Database Selection Criteria

The literature search was conducted in October 2023. The review procedure was carried out in accordance with PRISMA guidelines (Higgins et al., 2019). Specific inclusion and exclusion criteria were also defined with these guidelines. A study has to be peer-reviewed and constitute an original research contribution in order to be included. Book reviews, editorials, and book chapters were excluded during the process. English was required as the study's language. Due to time restrictions and a lack of linguistic proficiency, other languages were not included. The SLR only considered research that were published between 2013 and 2023 because this was the period when the number of digital platforms increased.

Table 1. gives analysis of the SLR's analysis model.

"Digital Platforms"	Technical features	Contents of paper
	Language Journal Authors Title Keywords	How did the authors approach the article? What is the definition of digital platforms? Which related topics are associated with digital platforms? Which methodologies were used for the paper?

Table 1. SLR's analysis model

Finfgeld-Connett and Johnson (2013, p. 2) indicate that 'literature searches should be viewed as open-ended iterative processes, whereby the topic or research question of interest is honed over time as the nature of evidence becomes more apparent to the researcher.' To comprehensively map out all relevant research on use of digital platforms among university students, the following search strings were used:

- "Digital platform usage among university students"
- "Online tools and platforms used by university students"
- "Digital technology adoption in higher education"
- "E-learning platforms and university students"
- "Online collaboration tools for university students"
- "Digital literacy and university students"

There were no limitations on language, publication or document type, or even time at this point in the investigation. Extra searches were carried out using institutional access and an academic paper aggregator website to find acceptable and pertinent peer-reviewed publications that were difficult to find in the chosen databases (Scopus, Emerald Insight, and ProQuest). We also looked through eligible full-text articles' reference lists to find further publications. The quest for literature involved consulting with a licensed librarian. The first and second authors extracted the data from the eligible studies, and the remaining authors reviewed it. In order to guarantee correctness in the extracted data, disagreements among the authors during the data screening and extraction stages were settled during their meetings. Authors, publication year, journal, research paradigm, research continent, and digital platform type were among the data retrieved. These data were useful in mapping the evidence to address the research questions and informing pertinent suggestions for more research. The authors went over the final data extraction and categorized it into themes before presenting and discussing the findings.

2.2. Data Cleaning

To enhance the quality of the results, inclusion and exclusion criteria (Table 2) were established with the aim of excluding any articles that were blatantly irrelevant to the research topics (Staples & Niazi, 2007). Through a numerical analysis of the retrieved and charted data, the descriptive characteristics of the review were determined. The studies' characteristics were described using frequency counts and percentages. The distribution of articles from databases, the distribution of articles annually, research paradigms, and study location were the categories for the numerical descriptive statistics.

Include if:	Exclude if:
The expression “digital platforms” showed in the abstract or keywords	It was a translation or duplicate of a title that was already in the sample
The text fitted digital media landscape and policies	The concept was used in another study such as anthropology, sociology and did not explore issues on digital media landscape and policies.
It was a peer-reviewed research article	It was a conference paper, a dissertation, thesis, book or book chapter
The language used is English	The language used is not English. For example, Portuguese, Spanish, French, among others
The article was published between 2013 and 2023	The article was published before 2013

Table 2. Inclusion and exclusion criteria

To limit the hits in the databases, only the title, abstract and keywords were used. The work flow diagram for data selection and cleaning is summarized in **Figure 1**.

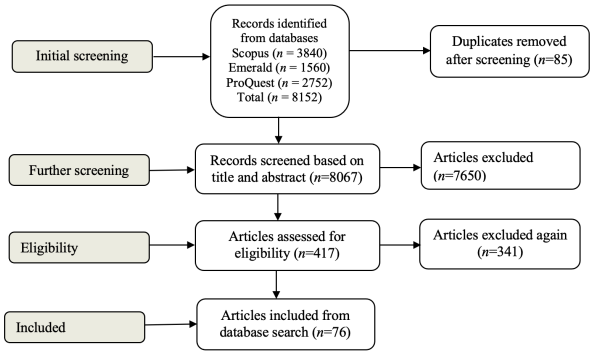

Figure 1. PRISMA Model with the literature review process on digital learning platforms

The researchers identified 8152 articles published between 2013 and 2023 from Scopus, Emerald Insight and ProQuest databases. Scopus constituted (47.10%, *n* = 3840), Emerald Insight (19.14%, *n* = 1560) and ProQuest (33.76%, *n* = 2752). Distribution of articles from the database is shown below:

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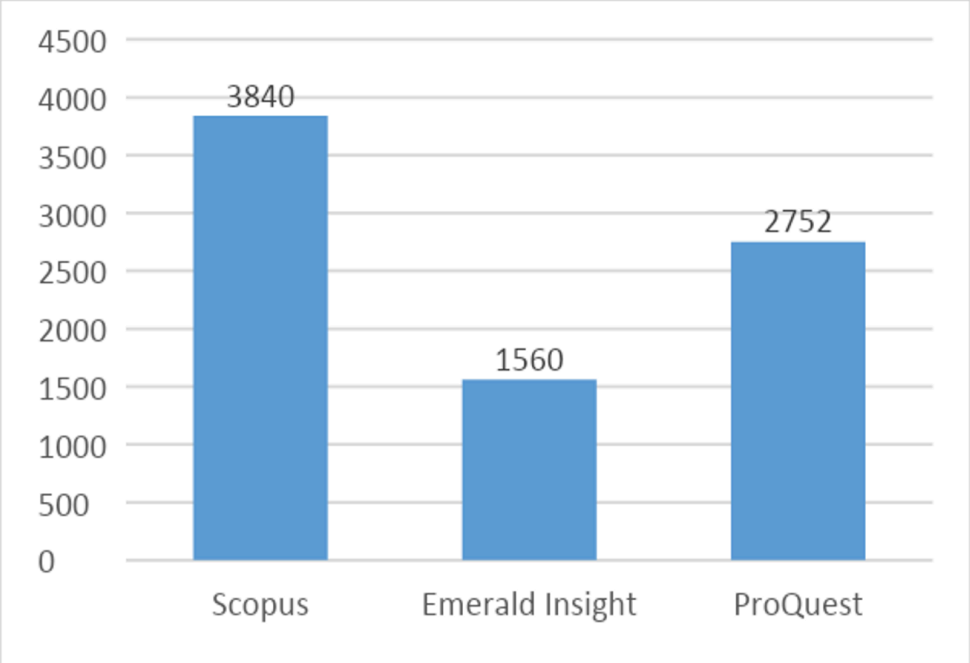

Figure 2. Distribution of articles from database

There were 1.04% (*n* = 85) duplicates removed and 98.96% (*n* = 8067) retained. The duplicates (Scopus, 0.43% *n* = 35; Emerald Insight, 0.36% *n* = 29 and ProQuest, 0.25% *n* = 21) were removed because they were different versions of the same document published in other journals. The remaining 98.96% (*n* = 8067) articles were further screened according to the inclusion and exclusion criteria out of which 93.84% (*n* = 7650) were eliminated. These articles (Scopus, 44.17% *n* = 3601; Emerald Insight, 18.40% *n* = 1500 and ProQuest, 31.27% *n* = 2549) were eliminated because they were not published in scholarly peer-reviewed journals.

From the 417 articles assessed for eligibility and possible inclusion in the study, a total of 5.12% (*n* = 314) were again excluded (Scopus, 2.50% *n* = 101; Emerald Insight, 0.38% *n* = 31 and ProQuest, 2.24% *n* = 182) because they focused on the use of digital platforms among students at the Basic and Senior High School level.

The work flow shows that 76 articles (Scopus, 0.47% *n* = 38; Emerald Insight, 0.09% *n* = 8 and ProQuest, 0.37% *n* = 30) passed the criteria for inclusion in the study. These articles were published between 2013 and 2023, written in English and published in scholarly peer-reviewed journals. In addition, these articles focused on the use of digital platforms among university students. **See Figure 3.**

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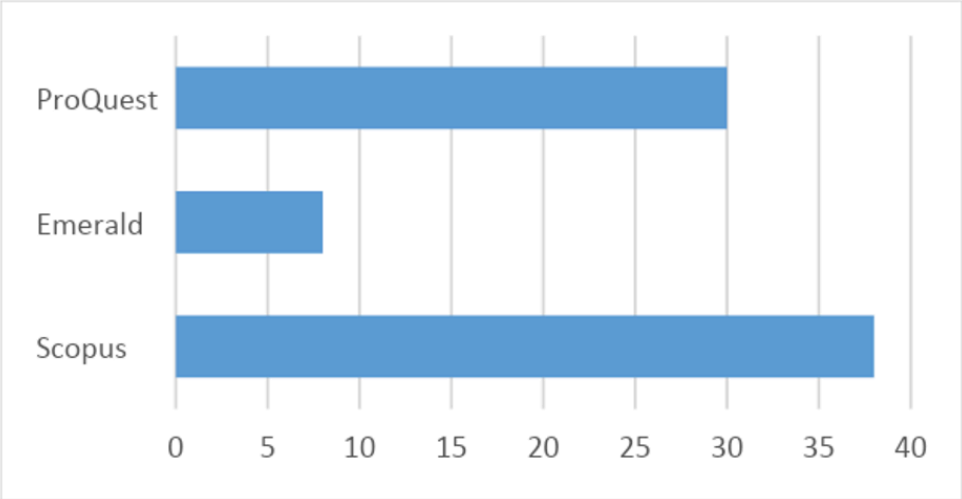

Figure 3. Article inclusion analysis

2.3. Thematic analysis

Using Braun and Clarke (2006), thematic analysis was conducted by the authors. The data were coded and themes emerged directly from the presented data, independent of pre-existing themes but aligns with the research questions. This stage of the analysis included multiple steps. The authors thoroughly read the text to acquaint themselves with the data, formulated multiple initial codes, investigated emerging themes, scrutinized these themes, defined and labelled them, and finally compiled the report. Furthermore, all authors extensively deliberated on the emerging themes until a unanimous decision was reached. These themes underwent continual review, incorporating new data, until the definitive themes were established.

3. Results and Discussion

3.1. Study characteristics

3.1.1. Yearly distribution of digital platform related papers

Findings of the study reveals that COVID-19 crisis has further shown the value of strategic management and flexibility in the higher education sector through the use of digital platforms. The SLR makes it clear that between 2019 and 2023, university students' use of digital platforms grew significantly. This finding is supported by Dalipi et al. (2022), Naidoo (2020), Yamoah and Haque (2022), and others who claim that the adoption of digital platforms and technologies for online teaching and learning in higher education has accelerated due to the combination of digital information and communication technologies' convergence with lockdown measures implemented in response to the COVID-19 pandemic.

Similarly, Alam et al. (2022) confirm that the COVID-19 pandemic altered the expectations of educators and students, particularly with regard to the usage of digital media.

Even though this study covered the past decade, there were no articles selected from 2013 and 2014. Research on the use of digital platforms among university students started showing up in 2015 with only two articles. It was discovered that the year 2016 and 2019 had three and five articles respectively. The year 2017 and 2018 also had two articles each. The highest number of articles (43%, n = 33) was recorded in 2023 followed by 2022 (18%, n = 14), 2021 (12%, n = 9), and then 2020 (8%, n = 6). It is outstanding that the last four years (2020 to 2023) also accounted for 82% (n = 62) of the selected publications that we reviewed **(See Figure 4).** It is obvious from the SLR that the emergence of COVID-19 necessitated more scholars to research how students use digital platforms. This confirms the finding of Alam et al. (2022) studies that the use of digital platforms among students gained prominence in 2020 after the COVID-19 pandemic hit the world.

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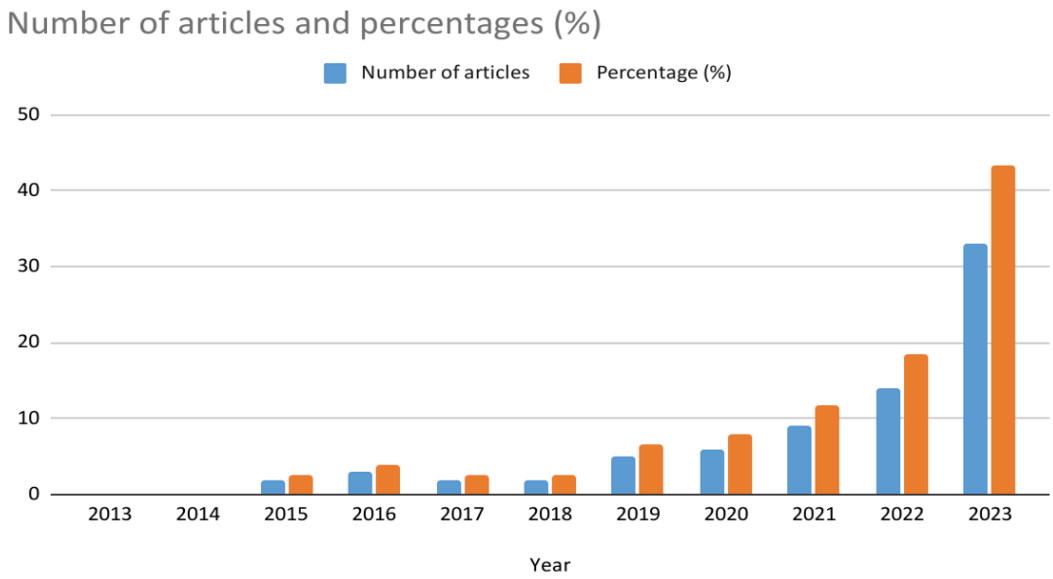

Figure 4. *Yearly distribution of digital platform related papers*

3.1.2. Research paradigms

Our review indicates that scholars who research on the use of digital platforms have adopted variety of methods to study the phenomenon. As shown in **Figure 5**, four research paradigms with distinct data collection methods were identified. They are qualitative (28%, *n* = 21), quantitative (46%, *n* = 35), mixed methods (11%, *n* = 8) and descriptive (16%, *n* = 12). It is evident from the SLR that the predominant research paradigm used by scholars on digital platforms is quantitative. These scholars used surveys and questionnaires to test objective theories by examining the relationship among variables and differences between groups. This finding corroborates Creswell (2013) view that quantitative research is most suitable when examining the relationship among variables so that numbered data can be analysed using statistical procedures. Similarly, Patton (2019) indicates that the most prevalent method of data collection in quantitative studies is the use of questionnaires because of their efficiency and cost-effectiveness in the collection of vast amount of data.

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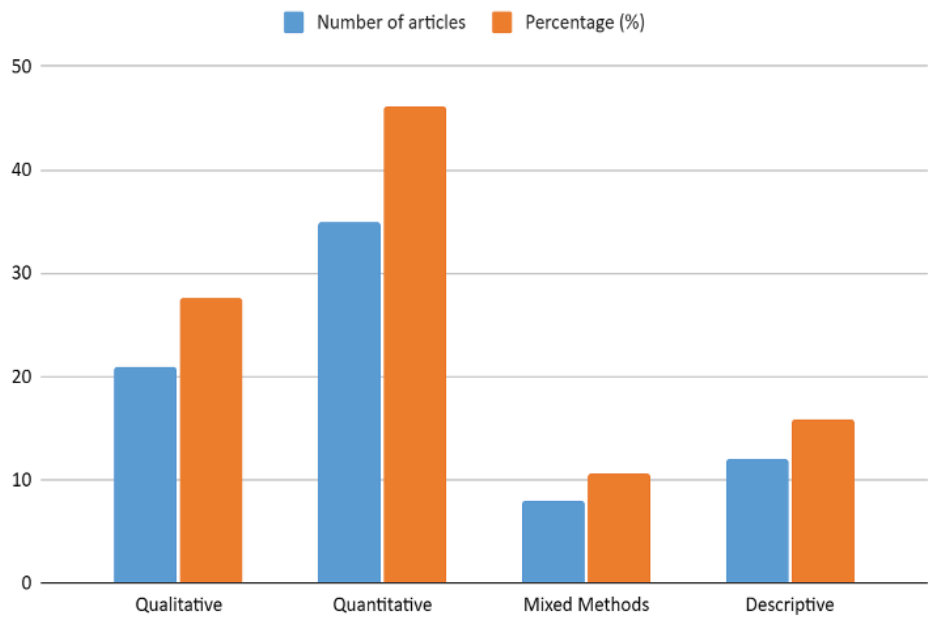

Figure 5. Research paradigms on digital platform papers

3.1.3. Study location

The statistical analysis of the chosen studies (n = 76) shows that there is a global interest in studying how university students use digital platforms (See Table 3). The research also showed that while the majority of studies (41%, n = 31) have been conducted in Asia, there is an increasing corpus of studies on digital platforms being conducted in North America (8%, n = 6), Europe (25%, n = 19), South America (5%, n = 4), Africa (17%, n = 13), and Oceania (4%, n = 3). This result is in line with a study by Fu et al. (2021), which shows that the use of digital platforms has grown significantly over the past several decades all over the world.

Similarly, Gawer (2021, p. 1) argue that 'in recent years, digital platform firms such as Google, Amazon, Facebook, and Alibaba have risen to global prominence.'

3.2. Digital platforms' technological affordances to support teaching and learning (RQ1)

'Technology is changing the experiences of learning with increasing speed' (Demsash et al., 2023, p. 1). Although the last several decades have seen a tremendous amount of technological progress, we are just at the beginning of a new age. The SLR revealed that impact of digital platforms on learning is very strong and that benefits can be utilized to create positive reinforcement among university students. The review further identified that the revolutionary development of digital platforms and its reach in the educational sector is a window of opportunity for influencing students' learning. This finding resonates with studies by recent scholars such as dos Santos et al. (2022) and Moreno-González (2022) that the use of digital platforms into the educational sector has brought about new ways of learning among students.

The study identified five main themes pertaining to the digital platforms' technological affordances to support teaching and learning **(See Table 3)**. These themes are MOOCs, Interactive learning tools, Learning Management System (LMS), Video conferencing tools and Social media.

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Theme	Digital platforms	Authors
Massive open online courses	Google classroom, AWS educate, Edx, Coursera, Udacity, Futurelearn, Xuetangx	dos Santos et al. (2022); Kundu & Bej (2020); Singh et al. (2021); Yeboah (2022); Zheng et al. (2017)
Interactive learning tools	Kahoot, Quizlet, Socrative, EndNote, RefWorks, Netflix	Pandey (2017); Sun & Hsu (2013); Wang et al. (2011)
Learning management system	Moodle, Canvas, Blackboard collaborate, Sakai	Adeshola & Agoyi (2022); Al-Motrif (2023); Alam et al. (2022); González et al. (2022)
Video conferencing	Zoom, Microsoft Teams, Google meet, WebEx	Amin & Sundari (2020); Damsash et al. (2023); Dalipi et al. (2020); Naroo et al. (2022); Szűts et al. (2023)

Table 3. Digital platforms technological affordances to support teaching and learning

3.2.1. Massive Open Online Courses

The study revealed that student learning has been greatly reshaped by the advent of MOOCs. These digital platforms have transformed the way students engage with learning materials. According to Kundu & Bej (2020), MOOCs are a novel kind of online learning environment that grants free access to course material, frequently given by well-known experts, to an infinite number of learners from anywhere in the world. Kaplan & Haenlein (2016) highlight that MOOC is a course in which enrollment is often open to as many people as possible who study independently at various times and locations without adhering to a set timetable. dos Santos et al. (2022) also indicate that these courses can be used to support lifelong learning and the development of specialized professional abilities, both of which are UN Sustainable Development Goals (SDG4).

The study's findings showed that a large number of higher educational institutions around the world had used a variety of strategies to raise educational standards, particularly through the provision of e-learning through MOOCs. The ability to make decisions and access education from any remote location was something that students enjoyed about e-learning, as it allowed them to participate in collaborative learning. This result is in line with a study by Parker et al. (2019), which found that MOOC growth has been aided by the introduction of digital platforms into the educational space. In a similar vein, Singh et al. (2021) assert that MOOCs and e-learning provided the initial means of minimizing students' academic loss. According to Zheng et al. (2017), the advancement of information technology has made knowledge acquisition possible outside of the traditional classroom, and MOOCs are currently among the most talked-about subjects in the educational community.

MOOCs are a relatively recent phenomenon that have profoundly changed the perception of online education. It is crucial to recognize that MOOCs have drawn students from all around the world and become well-known at prestigious universities. Some scholars (Singh et al., 2021; Zheng & Yang, 2017) argue that MOOCs represent a revolution in teaching that gives access to reinvention of old classroom-learning theories. Some of the digital platforms used in the MOOCs are: Google classroom, AWS educate, Edx, Coursera, Udacity, Futurelearn, and XuetangX.

3.2.3. Interactive learning tools

The SLR revealed that integration of interactive learning tools in educational institutions represents a pivotal advancement in modern pedagogy. Through technological advancements, educational institutions are harnessing the power of digital platforms and interactive tools to transform the learning experience of students. The study found out that interactive learning tools such as Kahoot, Quizlet, Socrative, EndNote, RefWorks and Netflix have altered dramatically traditional teaching methods, offering dynamic and fascinating opportunities for student engagement. Sun & Hsu (2013) concur with the study's findings that interactive online technologies give teachers the chance to improve student-teacher communication while also improving the online learning environment.

Interactive online resources boost individual students' engagement and drive to study, even if they are frequently used to make up for the lack of face-to-face connection in a traditional educational setting. According to Pandey (2017), learners are allowed to select the learning level that corresponds with their competencies, which allows them to be more focused and involved in the interactive online learning activity. Interactive teaching resources, according to Evans & Sabry (2003), can help students become more self-motivated and take charge of their own education. In a similar vein, Wang et al. (2011) assert that interactive learning tools improve learning because they give users the freedom to learn at their own speed and take charge of the process. The interactive features of educational technologies facilitate student engagement and extend their focus during the learning process.

3.2.4. Learning management system

Findings of the review indicate that LMS has emerged as a robust platform that enclose a different array of functionalities, providing a dynamic, structured, and interactive space for teaching and learning. Alam et al. (2022, p. 3) underscore some of the basic requirements of the LMS as 'presentation of the lesson content, control of the lesson, communicating with the students, motivation to learn, observation of learning progress and assessment.'

LMS platforms such as Moodle, Canvas, Blackboard collaborate and Sakai provide a centralised repository for course materials, including lecture notes, readings, videos, and other resources. This accessibility allows students to review these materials at their own pace and convenience. This result is in line with the research by González et al. (2022), which discovered that there are three methods in which students use LMS. First, course announcements, test dates, assignment information, and course outlines are all obtained through the use of LMS as a medium for academic and administrative communication. Getting academic resources like PPTs, lecture notes, course work guidelines, book chapters, or articles is the second documented use. Lastly, students say they communicate in online forums through the LMS.

But González et al. (2022) and Adeshola & Agoyi (2022) have different opinions. Adeshola & Agoyi (2022) assert that just because several colleges abruptly implemented learning management systems (LMS) and communication tools in response to the coronavirus outbreak, it does not follow that students are utilizing the LMS. These academics provided a strong case for the ongoing evaluation of the LMS adoption process in order to determine whether or not students are using it effectively and, more crucially, to consistently encourage them to engage with the e-learning platforms. Irrespective of these divergent views posed by Adeshola & Agoyi (2022), Al-Motrif (2023) argues that learning through the LMS is much simpler and more understandable. In the digital era, LMS has emerged as an essential platform that facilitates effective learning and development. Inasmuch as the LMS provides a centralized platform for organizing and managing learning materials, it also allows educational institutions to streamline their content, making it easy and accessible to learners at any time.

3.2.5. Video conferencing

In the realm of modern education, the integration of video conferencing tools such as Zoom, Microsoft teams, Skype, Google Meet and WebEx has ushered in a transformative era, reshaping the landscape of learning and offering unprecedented opportunities for educational interaction beyond physical boundaries. Findings of the SLR revealed that video conferencing tools have swiftly emerged as indispensable digital platforms with immersive learning experiences for students across the globe. This result aligns with the perspective of Amin & Sundari (2020), who suggest that video conferencing platforms provide real-time, face-to-face, synchronous communication between educators and students. Similar to this, Szűts et al. (2023) suggest that self-prepared instructional video content and real-time written and video-based chat that improves student learning are the most successful forms of instruction in the augmented online classroom.

Skype is well-known for virtual meetings and presentations in Indonesia. During the pandemic, instructors also became highly familiar with Zoom, Cisco WebEx Meeting, Google Meet/Hangout, and Microsoft Teams, among other video conference platforms (Amin & Sundari, 2020). Zoom was also mentioned by Naroo et al. (2022) as the most popular platform in their research. Phongsatha and Cleesuntorn (2017) used WebEx as part of their teaching and learning process and found from additional empirical evidence that the video-conference service helped them and gave their students a useful teaching tool. They came to the conclusion that both parties gain from using WebEx. While students found WebEx to be useful for discussions and presentations, faculty members found it useful for advising, tutorials, discussions, and work presentations. The student participants in the course who were surveyed expressed positive

agreement with all criteria related to the utilization of Cisco WebEx meetings. They stated that students use video conferences for their coursework even in times of disaster, like the COVID-19 pandemic. This perspective aligns with Phongsatha and Cleesuntorn's (2017) assertion that integrating WebEx into instruction is a practical and efficient way to facilitate discussion and learning. Furthermore, Mujačić et al. (2014), claimed that online conferencing technologies had a major impact on students' interest and satisfaction

It is important to indicate that the integration of video conferencing tools in education has not only facilitated remote learning, but has also opened doors to a myriad of possibilities. Through live sessions (Amin & Sundari, 2020), interactive discussions (Phongsatha & Cleesuntorn, 2017), multimedia presentations (Mujačić et al., 2014), and the ability to connect with experts worldwide, these tools offer students an engaging and interactive platform that transcends the limitations of physical classrooms.

3.3. Challenges associated with the deployment of digital platforms (RQ2)

The integration of digital platforms in higher education has brought about a new era in higher education, promising innovative avenues for learning, collaboration, and engagement. Diverse and overlapping obstacles still stand in the way of the widespread use of digital platforms, despite the growing interest in their potential. Balzotti and McCool (2016) argue that although the advantages of using digital platforms seem clear, there are a number of challenges associated with this technology. The review identified internet accessibility, pedagogical hindrances, digital literacy, and security/privacy concerns as the challenges associated with the deployment of digital platforms among university students.

3.3.1. Internet accessibility

The Internet contributes to the opportunities for learners to meet their learning needs (Sari & Octavian, 2021). With technology-enhanced in the education sector, the Internet serves as a supporting tool that help students find communicative learning resources. For example, according to Jacobs et al. (2023), the COVID-19 epidemic has permanently changed mathematics classrooms because the Internet is now a vital teaching and learning resource. For the same reason, Szuts et al. (2023) state that over half of the world's population currently uses the Internet as a global network for communication and information storage.

Despite the growing importance of digital platforms, the issue of Internet accessibility emerges as a critical hurdle that demands urgent attention. Findings of the study revealed that as educational institutions adopt digital platforms, the barrier of unequal access to reliable Internet connectivity emerges as a formidable challenge. For most of the studies that we reviewed (Alam et al., 2022; Dwumah-Manu et al., 2023; Evans & Gawer, 2016; Koskinen et al., 2019; Moreno-González, 2022; dos Santos et al., 2022; Sari, 2021; Sz˝uts et al., 2023), it was discovered that while digital platforms offer a plethora of opportunities for collaboration, knowledge dissemination, and interactive learning, the uneven distribution of high-quality Internet connectivity exacerbates disparities among students.

The study indicates that students in rural areas often grapple with unreliable connections or limited access to high-speed Internet, thereby impeding their ability to fully engage with digital learning resources. Findings of the study are consistent with the view of Yamoah and ul Haque (2022) who assert that poor Internet connection is one of the biggest challenges for students on the use of digital platforms. In a similar vein, El Mourabit (2023) notes that many students lack access to online learning due to significant national disparities in Internet speed.

According to Hamdan et al. (2020), the two biggest obstacles to e-learning implementation are funding e-learning initiatives and the absence of Internet connectivity. These academics contend that because e-learning is not seen as a priority by universities, funding for it is still scarce. Nasrat et al. (2020) identified two challenges encountered during the COVID-19 pandemic: a financial one stemming from the high expense of Internet connection, and a technological one involving sluggish Internet speed and unstable electrical supply. According to Maatuk et al. (2022), using digital platforms is hampered by low Internet service quality, which also makes e-learning difficult. The discussions above make clear that if teachers and students lack access to computers and a quick Internet connection, online learning will not be able to take off.

3.3.2. Pedagogical hindrances

Findings of the review indicate that pedagogy plays a critical role in determining the success or hindrance of digital platform adoption within educational settings. While digital platforms offer a myriad of opportunities for innovation and interactive learning experiences

(Maatuk et al., 2022), the alignment between pedagogical strategies and the use of these platforms is not without obstacles, often posing significant barriers to their effective deployment (El Mourabit et al., 2023). At the heart of this challenge lies the divergence between traditional pedagogical approaches and the evolving landscape of digital education. Educators, deeply rooted in established teaching methodologies, encounter a pedagogical challenge when tasked with incorporating digital platforms into their teaching practices. Resistance to change, a reluctance to deviate from familiar methods, or uncertainties about the efficacy of digital tools in fostering learning can impede educators from fully embracing these technological advancements.

The study's findings are supported by El Mourabit et al. (2023), who point out that creating an online course can be difficult because sometimes the material is only theoretical. As a result, it prevents students from practicing and studying efficiently. Inadequate course material is another major issue. According to Hamdan et al. (2020), choosing the right pedagogical model affects or has consequences for online learning. Teachers have to put in a significant amount of extra work when creating an online course, as indicated by Nasrat et al. (2020). El Mourabit et al. (2023) contend further that a large number of educators in underdeveloped nations lack experience translating their subject matter expertise into virtual content.

Nevertheless, it is important to acknowledge that the integration of digital platforms into pedagogy demands a delicate balance between technology and pedagogical principles. Hence the mismatch between the functionalities of digital tools and pedagogical objectives can hinder their effective use.

3.3.3. Digital literacy

The increased use of digital platforms in education has made digital literacy more essential than ever (Cheng et al., 2023). Since it offers a structured way of getting familiar with the digital world, students with digital literacy skills become comfortable and confident in navigating online learning platforms. Digital literacy education, according to Frydenberg and Andone (2016), should focus on helping students acquire the critical skills they need to engage in today's technologically advanced society both responsibly and productively. Conversely, people without this ability could find it difficult (El Mourabit et al., 2023).

Findings of the study indicate that the efficacy and equitable utilisation of digital platforms are hindered by the diverse levels of digital literacy. While some students exhibit a high degree of digital fluency, adeptly maneuvering through various digital tools and platforms, others grapple with limited skills, hindering their ability to harness the full potential of these digital platforms. Stewart (2023) concurs with the study's findings that some teachers find it difficult to integrate digital literacy practices in a way that offers multimodal communication and emulates students' literacy activities outside of the classroom. Consequently, it is critical to comprehend how students can use digital tools and the potential ramifications for educational practice as learning continues to be mediated through online contexts. Less digital literacy has been a barrier to MOOCs in developing nations like India for the past 20 years, according to Singh et al. (2021). To put it simply, in order for students to succeed in the knowledge-based workforce, they must possess a variety of digital literacy abilities. Acquiring these digital literacy skills on the use of digital platforms will further enhance their academic achievements.

3.3.4. Security/Privacy concerns

The review highlighted that despite numerous benefits of digital platforms such as offering diverse opportunities for communication (Sun & Hsu, 2013), collaboration (Pande, 2017) and learning (Sari & Oktaviani, 2021), concerns about security and privacy risks associated with these platforms have garnered significant attention.

The study revealed that students inadvertently share sensitive personal information such as personal addresses, contact details and private discussions, raising concerns about data privacy and confidentiality. This result supports the assertion made by Singh et al. (2021) that university students have experienced security concerns when using robust platforms. Deng and Tavares (2015), for instance, point out that there have been significant privacy concerns expressed, such as the possibility of teachers viewing a student's personal page. Additionally, when faced with technical difficulties including privacy concerns, insufficient Internet connection, and restricted webcam and microphone capabilities, students may encounter difficulties and exhibit displeasure (Ng & Fang, 2023). News stories, according to Deng and Tavares (2015), have drawn attention to privacy concerns, such as unauthorized users accessing user credentials and logging into classes. Security experts have cautioned that Zoom's default settings are not secure, which has resulted in a reaction against the company in terms of privacy and security (O'Flaherty, 2020). Zoom has

upgraded the security and privacy settings of school accounts on a continuous basis to allay these worries and better safeguard users. Ensuring transparent data rules on digital platforms and putting in place strong data protection measures are necessary to address these privacy issues.

3.4. Suggested future research directions (RQ3)

The exploration of future research directions on the use of digital platforms among university students reveal several opportunities for advancing understanding and addressing critical issues in contemporary education. As technology continues to permeate every aspect of academic life, it is essential to stay abreast of emerging trends, challenges and opportunities to ensure that digital platforms effectively support teaching and learning. **Table 4** highlights the various research areas that needs to be explored.

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Author (s)	Suggested areas of future research
Alam et al. (2022)	Analyzing how students' intentions to continue utilizing online platforms are affected by the tiredness brought on by technostress.
Dalipi et al. (2022)	Investigating the ways in which people with physical disabilities turn to digital media.
Singh et al. (2021)	Examining the viewpoints of important HEI stakeholders regarding the development of online learning.
Frydenberg & Andone (2016).	Analyzing the inspiration behind student Vine videos, the methods they employed, and strategies for distilling a difficult subject into a brief message.
dos Santos (2022)	Studies on how educational enterprises use business models and how the features of the platform lead to the production of value.
Jacobs et al. (2023)	Quantitative study that looks into how often students use WhatsApp, with an emphasis on performance and engagement in relation to socioeconomic status, gender, and race
Sari & Oktaviani (2021)	Exploring the potential effects of online learning platforms.
Amin & Sundari (2020)	Research to ascertain the opinions and preferences of educators regarding the use of digital learning platforms.
Yeboah (2022)	Research on how students are implementing online learning to find out what needs to be improved so that the process is strengthened.
Al-Motrif (2023).	Improving digital technologies, impacts and factors affecting digital learning.
Deng & Tavares (2015).	Subsequent research in this area may benefit from understanding how students view technology and what influences their use of it.
Paul (2023).	Study on teacher's perception, views and impact on digital education, educational technology utilizations and other teaching-learning process.
Cabellos et al. (2023)	Analysis of cases centered on good practices in the use of ICT among students.
Naidoo (2020).	Identifying further interesting experiences that graduate students in mathematics education have when using digital platforms to master the subject.
Adeshola & Agoyi (2022).	Examining how various generational cohorts engage in e-learning, how many hours students spend on the platform, and other aspects of students' academic success.
González et al. (2022)	Socioeconomic factors, which can have an impact on how pupils employ digital tools to get a reliable, strong Internet connection.
Ng & Fang (2023).	Examining the effective utilization of various online conferencing technologies to enhance and supplement current qualitative methodologies.
Buragohain et al. (2023)	More research on the usability and optimization of English across disciplines and sectors is explored.
Dwumah-Manu et al. (2023)	The impact on acculturation of demographic factors such as age, sex, personality traits, academic program, and length of stay.
Amin & Sundari (2020).	How language teachers conduct online teaching and learning in specific contexts and how some teachers manage to overcome challenges
El Mourabit et al. (2023)	Enhancing the use of ICT and encouraging online learning in order to rebuild and revitalize the educational system.
Cheng et al. (2023)	Investigating how students take online courses in different universities,
Park et al. (2021)	Utilizing a longitudinal approach, which offers a more precise framework for customizing digital interventions and mental health education for children.

Table 4. Suggested areas of future research

From **Table 4**, it is evident that future research directions primarily focus on examining the potential effects of online learning (Alam et al., 2022; Dalipi et al., 2022; Sari & Oktaviani, 2021), investigating teachers' and students perceptions toward the use of digital learning platforms (Amin & Sundari, 2020; Deng & Tavares, 2015; Paul, 2023) and exploring stakeholder engagement in online learning (Adeshola & Agoyi, 2022; Singh et al. (2021).

3.5. Limitations

We admit that this study has several limitations, which nonetheless, would not undermine the contributions of the study. First, due to restrictions on search strategies and database coverage, the review might not encompass all relevant studies due to limitations in search strategies and database coverage. Although Scopus, Emerald Insight, and ProQuest are reputable and extensive databases, a complete and objective systematic review requires an appreciation of their limitations. Not all journals may be included in these databases, particularly those that are newer or less prominent. Several significant regional journals may not be included. In order to address these drawbacks and guarantee a more thorough and impartial evaluation, we advise combining databases and resources that concentrate on regional research with Scopus, Emerald Insight, and ProQuest. Second, as digital platforms are utilized worldwide, limiting the review to peer-reviewed publications exclusively published in English may have hampered its comprehensiveness, since other high-caliber research articles might have been published in journals that do not use the English language. The writers, however, were forced to limit themselves to English-language due to their lack of proficiency in other languages. We suggest that in order to fulfill present needs, future research could incorporate translation technologies to alleviate this constraint. Third, by concentrating on a single decade (2013–2023), the review may overlook prior pertinent studies, which could lead to the omission of significant historical contexts and trends. In order to gain a more comprehensive knowledge of the phenomenon, future research could concentrate on these and other gaps. However, these drawbacks in no way take away from the insightful findings of this study.

4. Conclusion

This SLR offers significant insights for platform-based educational research by summarizing studies on university students' usage of digital platforms. The study found that learning experiences are rapidly evolving due to technology. Applying technology through digital learning platforms can help learners progress more quickly on a personal level and make learning possible "anywhere, anytime, and anyhow." The SLR found that university students utilize MOOCs, interactive learning tools, LMSs, and video conferencing technologies more than any other digital platform. The SLR makes it evident that digital platforms have a significant influence on contemporary education and that these platforms' advantages can be used to encourage positive reinforcement among college students.

The advent of digital platforms in daily life and their penetration into the educational sector present a unique chance to impact students' learning. Because digital platforms became more convenient during the COVID-19 pandemic, university students have been increasingly aware of their value in improving the teaching and learning process. In their research on digital platforms among university students, scholars have employed a variety of qualitative, quantitative, descriptive, and mixed method approaches. However, the approaches were not quite proportionate, and the variations in usage frequency do not significantly favor any one way over the other. However, the COVID-19 epidemic has made strategic management and flexibility—particularly with regard to the use of digital platforms—even more crucial in the higher education sector.

According to the SLR, the rise of COVID-19 made it necessary for more academics to look into how students use digital media. We contend that the abundance of options available to us today has led to a rise in the use of digital platforms. We also argue that the COVID-19 epidemic played a major role in accelerating the widespread use of these technologies in higher education. Nevertheless, when studies began to show the potential of digital networks beyond its recreational uses, their use would have grown anyway. The adoption of technology and how outside factors like a pandemic might speed up adoption are two important topics covered in this study.

Recommendations

As much as digital platforms play a significant role in enhancing students' education, there are several challenges that hinder the effective deployment of these platforms. The authors recommend that universities provide digital literacy programs that educate students on the best ways of using digital platforms, online privacy and data protection.

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Data availability statement

Due to the lack of newly developed or analyzed data, data sharing is not applicable to this study.

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