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Mapping the intersection of e-learning, culture, and tradition: a bibliometric analysis

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ABSTRACT

The dynamic relationship between e-learning, culture, and tradition has become a compelling field of study due to the ongoing transformation of educational milieus through technology-driven learning. This study aims to identify and analyse patterns in research publications, active institutions, the impact of citations, and keywords on the intricacies of e-learning, culture, and tradition. This study analysed datasets obtained from the Scopus and Web of Science (WoS) databases using the ScientoPy and VOSviewer. The findings demonstrate a significant increase in research output, highlighting the increasing scholarly interest in understanding the intersection of e-learning, culture, and tradition. The prevalence of keywords such as "mobile learning", "e-learning", "cultural heritage", "augmented reality", and "distance learning" illustrates the dynamic of the educational field stimulated by technological progress and cultural influences. Also, the keywords emphasise exploring novel learning methodologies incorporating digital resources, protecting cultural heritage, and adapting to changing educational environments. This bibliometric analysis contributes to a greater comprehension of how e-learning interacts with cultural and traditional contexts, thereby enriching the discourse surrounding education in a world that is becoming increasingly interconnected.

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1. INTRODUCTION

Modern technologies such as machine learning and the internet of things (IoT) are being integrated into education to meet current demands [1]. There has been a significant increase in academic research on educational technology, particularly in e-learning, online learning environments, multimedia learning, and instructional design [2]. The growing interest in technology highlights the acknowledgement of its ability to revolutionise educational paradigms and improve learning experiences [3]. Digital advances in education can provide adaptive and personalised learning experiences that meet learners' diverse needs and goals in the digital age [4].

According to Pidhorodetska *et al*. [5], incorporating technology into educational settings can transform conventional pedagogical approaches, instructional materials, and assessment practices, facilitating digitalisation. The investigation of e-learning has been a prominent area of interest in educational technology research, with scholarly investigations examining the experiences of online learners, online instructors, and the effectiveness of curriculum-interactive learning settings [6]. The research has also examined the impact of e-learning on different aspects of education, including the integration of information and communications

technology (ICT), the full potential of educational technology, and the use of data-driven and intelligent educational technology [7]. Theories such as the community of inquiry and the technological acceptance model have been widely used in e-learning research [8]. Hence, it can be depicted that the field of e-learning research has yielded valuable insights into the convergence of technology, culture, and tradition within the realm of education.

Considering how technology-enhanced learning interfaces with varied cultural and traditional contexts is becoming increasingly imperative [9]. Culture substantially impacts learning processes, and people with different cultural backgrounds develop alternative interpretations and strategies [10]. Adapting e-learning systems to specific users based on cultural characteristics improves usability and flexibility [11]. Sociocultural learning, which harnesses learners' prior experiences and cultural influences, enhances skills acquisition and knowledge building [12]. Instructors and instructional designers must be aware of the importance of cultural factors in online learning environments. Connective technologies increase intercultural interaction in learning communities, including individuals from diverse cultural orientations [13]. A comprehensive comprehension of the significance of culture in online learning is necessary to develop online learning experiences that include diverse cultural backgrounds. In order to establish effective and inclusive educational experiences, it is imperative to acknowledge and integrate cultural elements within technology-enhanced learning.

The e-learning field has witnessed substantial expansion and can overcome cultural boundaries. According to Varekar [14], evidence suggests that integrating technology in collaborative learning might facilitate online collaboration and enable learners to develop a renewed sense of self-identity, enhancing their ability to actively engage in the learning process. Moreover, utilizing online spaces within digital platforms can foster engagement across culturally diverse student cohorts and facilitate the development of a shared cultural identity [15]. Nevertheless, implementing e-learning technologies encounters several obstacles and setbacks, and individualism-collectivism's cultural characteristics can be influenced [16]. In addition, it is imperative to develop culturally sensitive digital learning strategies in order to accommodate the growing population of various student cultural cohorts in higher education [17]. To optimise e-learning, structured faculty training in digital skills and innovative instructional methods is essential [18].

Numerous investigations have been conducted thus far regarding e-learning. Nonetheless, there exists a scarcity of research findings that specifically investigate the global discourse surrounding the evolution of the previous topic and provide recommendations for its continued advancement. Notwithstanding, specific findings from prior research are still deemed pertinent and amenable to being charted. E-learning is a modality of education conducted through electronic means utilizing information and communication technology [19]. Acquiring knowledge through e-learning entails receiving and comprehending educational resources via digital mediums [20]. The notion of e-learning has proliferated in numerous countries across the globe. E-learning has been incorporated into several nations' education systems [21]. As posited by Asad *et al*. [22], establishing explicit regulations and protocols by the government is imperative in guaranteeing the triumph and efficient progression of e-learning.

The dynamic convergence of e-learning, culture, and tradition has garnered increasing attention as technology-enhanced education intersects with diverse cultural and traditional contexts. This study conducts a comprehensive bibliometric analysis to map the research landscape at this intersection. By harnessing bibliometric techniques, the research aims to discern trends, collaboration patterns, and research impact within this intricate multidisciplinary domain. The main aims of this study are to ascertain and examine trends in research publications, patterns of collaboration among authors and institutions, and the impact of citations on works that investigate the complex relationship between e-learning, culture, and tradition. This study offers insights into the dynamic research landscape at the confluence of e-learning and varied cultural and traditional characteristics. Doing so intends to contribute to a more comprehensive knowledge of how e-learning interacts with these dimensions.

The following research questions will be addressed throughout this study: i) research question 1 (RQ1): how has the research volume of e-learning, culture, and tradition evolved?; ii) research question 2 (RQ2): what are the top ten most institutions that shape research about e-learning, culture, and tradition?; iii) research question 3 (RQ3): what are the top ten most cited papers of seminal works that explore the confluence of e-learning, culture, and tradition?; and iv) research question 4 (RQ4): which keywords and themes are prevalent in research publications related to e-learning, culture, and tradition?

2. METHOD

The methodology section plays a vital role in examining bibliographic datasets by offering a comprehensive framework and methodical approach, guaranteeing transparency, repeatability, and the integrity of the research process. This section discusses data sources and search criteria, outlining how we

curated pertinent information from Scopus and Web of Science (WoS) databases. It also delves into bibliometric software and the pre-processing of datasets, highlighting their role in facilitating data analysis and ensuring data integrity.

2.1. Data sources and search criteria

This study employed datasets from Scopus and WoS. The selection of Scopus and WoS databases for this bibliometric analysis is grounded in their well-established reputations as comprehensive and reliable sources for scholarly literature across various disciplines. Scopus and WoS offer extensive coverage of academic publications, encompassing a wide range of journals, conference proceedings, and other scholarly outputs [23]. This breadth ensures that the analysis captures diverse research articles relevant to e-learning, culture, and tradition, providing a comprehensive overview of the field.

The datasets were obtained from the Scopus and WoS databases utilizing predefined search criteria based on title, abstract, and keywords: ("online learning" OR "digital learning" OR "distance learning" OR "virtual learning" OR "blended learning" OR "web-based learning" OR "mobile learning" OR "remote learning" OR "digital education" OR "distance education") AND ("culture" OR "cultural" OR "cultural practices" OR "cultural heritage" OR "cultural identity" OR "cultural diversity" OR "cultural studies" OR "cross-cultural" OR "intercultural" OR "cultural anthropology" OR "cultural evolution") AND ("tradition" OR "traditional practices" OR "oral tradition" OR "folklore" OR "heritage" OR "rituals" OR "customary practices" OR "ancestral traditions" OR "indigenous knowledge" OR "folk traditions"). The accuracy of bibliometric analysis depends heavily on carefully selecting precise terms or keywords, which are crucial for efficient information retrieval and maintaining the integrity of study results. The retrieval process was performed on July 15, 2023, encompassing publications from various languages with a time restriction up to December 31, 2022.

Bibliometric techniques employed in this study are depicted in Table 1. The bibliometric techniques collectively provide a comprehensive understanding of the field's evolution, key contributors, influential works, and prevalent themes. They form the backbone of our endeavour to map the intricate interplay between e-learning, culture, and tradition within the scholarly landscape.

Table 1. Bibliometric techniques

Research question	Bibliometric technique	Data source	Software	Analysis approach
RQ1: Research volume evolution	Publication trend analysis	Scopus and WoS	ScientoPy	Timeline analysis
RQ2: Top institutions	Analysis of productive institution	Scopus and WoS	ScientoPy	Trend analysis
RQ3: Most cited papers	Citation analysis	Scopus and WoS	ScientoPy	Citation count ranking
RQ4: Prevalent keywords and themes	Evolution analysis and co-occurrence analysis	Scopus and WoS	ScientoPy and VOSviewer	Evolution analysis and network visualization

2.2. Bibliometric software and datasets analysis

This study utilised innovative methodologies and software tools to conduct a thorough bibliometric analysis of e-learning, culture, and tradition. The use of ScientoPy and VOSviewer had a crucial impact on improving visualization and enhancing the general understanding of the data. By effectively utilizing these prominent tools, the study effectively converted raw data into relevant and significant discoveries, thus enhancing the comprehensiveness and understanding obtained from the bibliometric analysis.

ScientoPy is a versatile Python library designed explicitly for bibliometric analysis [24]. Leveraging ScientoPy, we efficiently processed the publication data from Scopus and WoS databases [25]. This tool allowed us to extract relevant information such as publication dates, authors, affiliations, citations, and keywords [26]. We could pre-process the data through its functionalities, ensuring its readiness for subsequent analyses.

VOSviewer is a powerful software tool specialising in visualising and analysing bibliometric networks. This tool enabled us to create visually compelling data representations, allowing a deeper understanding of collaborative networks, thematic relationships, and citation patterns [27]. VOSviewer facilitated the creation of network maps, co-authorship clusters, and keyword co-occurrence maps [28]. We generated clear visualizations highlighting key trends and connections within our dataset by configuring parameters and settings.

2.3. Pre-processing analysis

The datasets were subjected to pre-processing to facilitate the integration of datasets from WoS and Scopus while removing duplicate entries. The procedure mentioned led to generating an additional dataset that can be utilised for further examination. The bibliographic dataset underwent pre-processing using

ScientoPy. During this phase, ScientoPy employs a standardisation process to replace the author's name with a semicolon when retrieving metadata from the Scopus database. Furthermore, the process involves the elimination of dots, commas, and special characters from the metadata of both databases. This eliminates duplicate entries with the same names and authors [24].

The information in Table 2 demonstrates that the initial results of the gathered data consist of 532 raw datasets obtained from Scopus and WoS publications. Apparently, 65 publications, accounting for 12.20% of the dataset, were removed due to the automated document-type filtering approach. At the outset, 467 publications were identified before commencing eliminating duplicates. The total number of duplicate entries identified in this inquiry was 88, encompassing data from both databases. Ultimately, 379 papers have been deemed suitable for inclusion in the continuing study. Among these, 224 publications (59.10%) were sourced from the WoS, while the remaining 155 publications (40.90%) were obtained via Scopus. The number of validated datasets fulfils the minimum criteria of 300 datasets for conducting a bibliometric analysis research [29].

Table 2. Data integration and duplicates exclusion

Data pre-processing output	Information	Number	Percentage (%)
Initial results	Raw data from Scopus and WoS	532	-
	Automatic type-filter publication to remove non-related document	65	12.20
	Total publications after selecting document types (Research articles, conference papers, book chapters, review papers, and proceedings)	467	-
	Publications in WoS	227	48.60
	Publication in Scopus	240	51.40
Duplicated removal results	Duplicated publications in both databases	88	18.80
	Duplicated publications from WoS	3	1.30
	Duplicated papers from Scopus	85	35.40
Final results	Total publications after eliminating duplicates	379	
	Publications in WoS	224	59.10
	Publications in Scopus	155	40.90

3. RESULTS AND DISCUSSION

This section aims to clarify the findings derived from the bibliometric analysis of e-learning, culture, and tradition. The objective is to thoroughly and precisely explain the findings, exploring the subtle details uncovered via the study. Furthermore, this part examines the ramifications and relevance drawn from the bibliometric discoveries.

3.1. The evolution of publications

The correlation between the growth of scholarly output in e-learning, culture, and tradition is intrinsically linked to the quantitative evaluation of publishing frequency. The present evaluation involves monitoring and examining the number of academic papers generated across a specific period, offering valuable observations regarding the developmental trajectory and varying levels of scholarly engagement in these interconnected disciplines. Figure 1 depicts the growth and evolution of publications. The study under consideration was first published in 1991, marking three decades since its initiation.

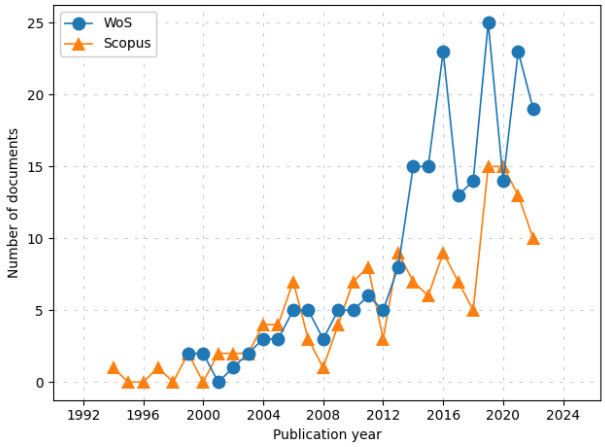


Figure 1. The evolution of publications

Figure 1 reveals discernible patterns in the progression of research publications on e-learning, culture, and tradition. During the early 1990s, the fields described in the research publications were found to have limited representation in both the WoS and Scopus databases. During the mid-1990s, there was a discernible uptick in published works, accompanied by a gradual surge in scholarly attention towards e-learning, culture, and tradition. Notably, 2001 is a significant milestone in the evolution of publication, characterised by a significant increase in publications, particularly inside the Scopus database. Since 2001, there has been a steady increase in published works, indicating a rising level of interest in the convergence of e-learning, culture, and tradition. The period after 2010 demonstrates a significant increase in published works, as seen by a rise in research publications within the defined domains in both databases. The years 2019 and 2020 exhibit a notable increase in publication output, with substantial contributions from both databases.

The publication growth and evolution results indicate a clear upward trajectory in e-learning, culture, and tradition research activity. Scholars have recognised the importance of cultural and traditional dimensions in shaping e-learning practices, leading to increased research initiatives focused on exploring and understanding these intersections [9], [30]. For example, the rise of research interest in e-learning, culture, and tradition, including using theoretical foundations such as Byram's model and the cultural convergence theory, has been prevalent in these studies [31]. Also, curricula in technology-supported cross-cultural learning have focused on cross-cultural learning, linguistic skills, and pre-service teacher training, increasing scholars' interest [32]. In e-learning, culture, and tradition, various technologies, including Skype, email, and blogs, have emerged as integral tools for communication and interaction. The amalgamation of these approaches enables a comprehensive understanding of the intricate interplay between technology-enhanced learning and cultural or traditional contexts.

3.2. The top ten most productive institutions

Analysing the institution that has exhibited the highest activity level in researching papers on e-learning, culture, and tradition is of utmost importance. Understanding the most influential institutions driving research on the intersection of e-learning and culture is paramount to remaining abreast of the latest developments, optimal methodologies, and pioneering approaches within this dynamic domain. This tool enables individuals to make well-informed decisions that positively influence educational methodologies, foster inclusivity, and guarantee that electronic learning harmonises with cultural values and customs. Figure 2 depicts the ranking of the ten most prolific institutions regarding their research output on e-learning, culture, and tradition.

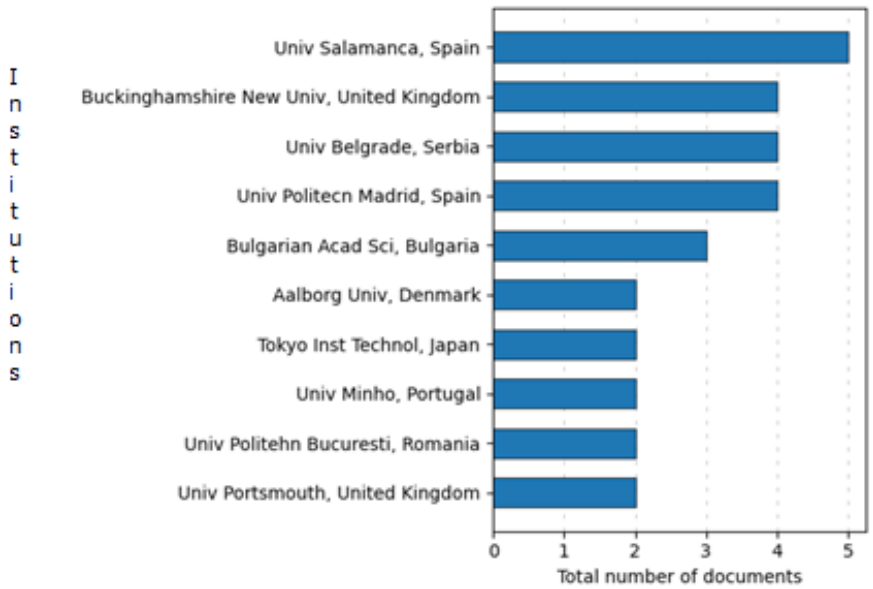


Figure 2. The top ten most active institutions

Based on the information in Figure 2, the top rank was the University of Salamanca, Spain. The University of Salamanca, located in Salamanca, Spain, is one of the oldest universities in Europe and holds a

strong reputation in various academic disciplines. It ranks 5 in the context of publishing research on e-learning, culture, and tradition. This indicates that the university has contributed significantly to research in these fields, particularly regarding the quality and quantity of its publications [33]. Notably, the high level of production exhibited by institutions in Figure 2 is influenced by various factors, including the educational landscape of their respective countries, the availability of money, the presence of robust research infrastructure, the extent of multidisciplinary cooperation, and the cultural contexts in which they operate [34]. The commitment of these institutions to investigating the intricate interplay between e-learning and culture establishes their prominence in producing knowledge that can contribute to the development of more efficient and culturally attuned educational approaches.

3.3. The top ten most cited papers

Table 3 compiles the ten most often referenced publications investigating e-learning, culture, and tradition. Understanding the most frequently referenced documents in e-learning, culture, and tradition empowers researchers, educators, policymakers, and practitioners to establish a robust groundwork, remain up-to-date with current advancements, and actively contribute to formulating efficacious and culturally attuned e-learning approaches. According to the data presented in Table 3, the three most prominent articles were authored by Joo-Nagata *et al*. [35], Rubino *et al*. [36], and Smith and Smith [37]. The study conducted by Joo-Nagata *et al*. [35] investigates the use of augmented reality (AR) in the contexts of mobile learning (m-learning) and e-learning. The article examines AR implementation in m-learning and e-learning. It is crucial to comprehend the findings of this study for various reasons. Understanding the effective integration of AR into educational programmes facilitates the development of more captivating and interactive learning experiences, consequently enhancing learner engagement and comprehension. Moreover, the study conducted in Chile indicates the importance of considering cultural and contextual factors in implementing AR in educational settings. Acquiring knowledge about this research can provide valuable insights into the adaptability of technology to diverse cultural contexts, enriching cross-cultural learning encounters [35].

Table 3. The top ten most cited papers

Authors	Title	Source title	Citations
Joo-Nagata *et al*. [35]	Augmented reality and pedestrian navigation through its implementation in m-learning and e-learning: Evaluation of an educational program in Chile	Computers and education	79
Rubino *et al*. [36]	Integrating a location-based mobile game in the museum visit: evaluating visitors' behaviour and learning	ACM journal on computing and cultural heritage	72
Smith and Smith [37]	Differences between Chinese and Australian students: some implications for distance educators	Distance education	59
Khlaif *et al*. [38]	Emergency remote learning during COVID-19 crisis: students' engagement	Education and Information technologies	54
Feigl *et al*. [39]	Dialogic global studies for multicultural technology assessment	Multicultural education and technology journal	43
Etxeberria *et al*. [40]	Mobile devices: a tool for tourism and learning at archaeological sites	International journal of web-based communities	37
Zhang *et al*. [41]	Online collaborative learning in a project-based learning environment in Taiwan: a case study on undergraduate students' perspectives	Educational media international	36
Coryell and Clark [42]	One right way, intercultural participation, and language learning anxiety: a qualitative analysis of adult online heritage and nonheritage language learners	Foreign language annals	35
Zhang [43]	Power distance in online learning: experience of Chinese learners in U.S. higher education	International review of research in open and Distance learning	32
Petrucco and Agostini [44]	Teaching our cultural heritage using mobile augmented reality	Journal of e-learning and knowledge society	31

Rubino *et al*. [36] wrote the second most cited paper (72 citations). The research investigates the integration of a location-based mobile game in a museum visit, focusing on visitors' behaviour and learning outcomes. Based on this article, museums are evolving to incorporate technology for educational purposes. This study helps educators and museum professionals understand how technology, such as mobile games, can enhance visitor engagement and learning outcomes [36].

Smith and Smith [37] wrote the third-ranked most cited paper, which obtained 59 citations. This research delves into the differences between Chinese and Australian students and their implications for distance education. Based on this article, cross-cultural differences impact learning styles and preferences.

This research sheds light on how educators can adapt distance education strategies to accommodate the diverse needs of students from different cultural backgrounds [37].

3.4. Keywords and themes

The keywords and topics that are widely observed indicate the prevailing trends and areas of concentration in the field [26]. Thus, understanding the dominant keywords and themes in the scholarly literature on e-learning, culture, and tradition is crucial for remaining knowledgeable, making valuable contributions to the discipline, directing research endeavours, and ensuring the continued relevance and efficacy of educational practises within a constantly evolving educational milieu [34]. Figure 3 shows the ten most used keywords by previous authors and the percentage of documents published in the last two years, 2021 and 2022 (PDLY). Based on Figure 3, "mobile learning", "e-learning", and "cultural heritage" were listed as the top three. The results hold significant importance in contributing to the knowledge and practices in e-learning, culture, and tradition.

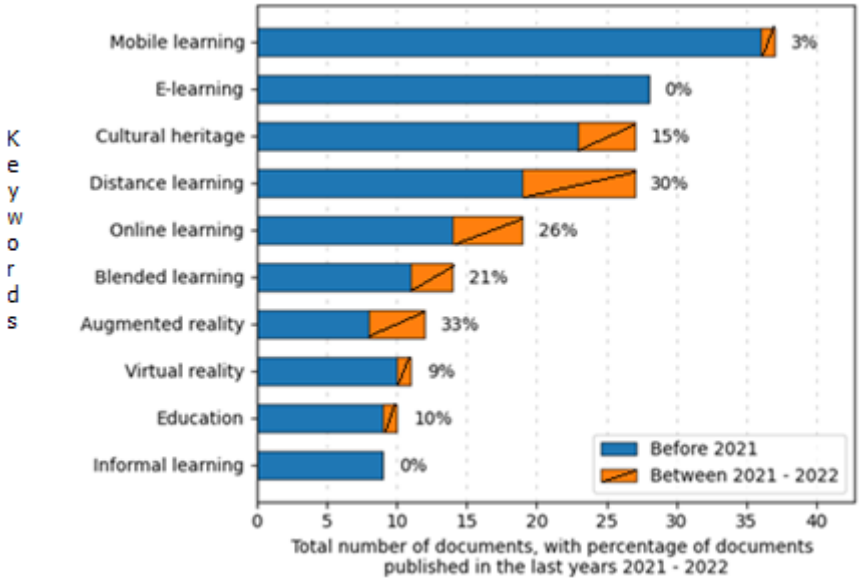


Figure 3. The ten most used keywords by previous authors

The prominence of "mobile learning" and "e-learning" signifies the continued evolution of educational paradigms in the digital age. These results reflect the growing recognition of the importance of technology-mediated learning approaches, especially those facilitated by mobile devices and online platforms [45], [46]. By emphasising these areas, the analysis acknowledges the transformative impact of digital tools on education, highlighting the need for research that explores effective pedagogical strategies, technological innovations, and the integration of mobile and online learning into mainstream educational practices. These results contribute to the ongoing discourse on how technology is reshaping educational landscapes and how institutions can adapt to meet the changing needs of learners.

Including "cultural heritage" as a top focus area underscores the critical role of preserving and promoting cultural traditions, practices, and historical knowledge. In an era of globalisation and rapid cultural exchange, understanding and safeguarding cultural heritage have gained heightened significance [47]. This result highlights the intersection of technology and cultural preservation, indicating a need for research that explores how digital platforms can be harnessed to document, share, and celebrate cultural heritage [36]. The emphasis on cultural heritage in the results indicates a call for interdisciplinary research that bridges fields like anthropology, history, technology, and education, fostering a deeper appreciation for diverse cultural identities.

The significant proportions of publications related to "augmented reality" and "distance learning," with 33% and 30% of the total publications published in 2021 and 2022, underscore their emerging importance within education and technology. The high proportion of publications related to AR indicates a growing interest in integrating immersive technologies into educational contexts [48]. AR can revolutionise how learning materials are presented and understood by overlaying digital content onto the physical world.

The substantial number of publications in recent years suggests that researchers are exploring various aspects of AR in education, such as its impact on learner engagement, knowledge retention, and the design of interactive learning experiences.

The substantial portion of publications on distance learning reflects the accelerated adoption and evolution of remote and online education. The years 2021 and 2022 were marked by the global impact of the COVID-19 pandemic, which prompted an unprecedented shift towards distance learning as traditional classrooms became less accessible. The prevalence of distance learning publications during this period likely indicates a surge in research focused on effective online teaching methods, best practices for remote instruction, technological solutions for enhancing virtual classrooms, and strategies to mitigate challenges associated with digital learning environments [49]. This trend emphasises the importance of exploring and refining distance learning approaches to ensure high-quality education in emergencies and regular contexts.

The application of VOSviewer in mapping analysis allows for a complete understanding of the links and patterns among author keywords in research on e-learning, culture, and tradition. The figure presented in Figure 4 (see in Appendix) demonstrates the representation of authors' keywords co-occurrence, considering a minimum keyword occurrence of five. Consequently, out of the 1102 keywords examined, a total of 25 keywords have satisfied the predetermined threshold criterion.

Information in Figure 4 (see in Appendix) emphasises that the keywords "e-learning" are closely associated with "digital education". The keyword "digital education" appeared in 2020. The keyword "culture" was closely linked to "Moodle" and "blended learning". "Moodle" and "blended learning" were established in 2016. Moreover, the keyword "culture heritage" was closely linked to "mobile learning"; these keywords were found in 2018.

The close association between the keywords "e-learning" and "digital education" highlights the growing recognition of digital technologies as integral components of modern educational practices. The appearance of "digital education" as a keyword in 2020 suggests an increasing emphasis on broader digitalisation efforts in education beyond the narrower scope of e-learning. This association emphasises the need for research that explores the methods and tools of online learning (e-learning) and the broader transformation of education through digital means (digital education) encompassing various modes and formats of instruction [50], [51].

The linkage of "culture" with keywords like "Moodle" and "blended learning" signifies an awareness of the cultural implications in the context of educational technology. The appearance of "Moodle" and "blended learning" in 2016 suggests that these keywords were already recognised in the academic discourse as methods for integrating technology into education. The connection between "culture" and these keywords suggests recognising the need for cultural sensitivity and adaptation when implementing technology-enhanced education approaches [52]. This association highlights the importance of effectively researching how to integrate diverse cultural perspectives into digital learning environments.

The close relationship between "cultural heritage" and "mobile learning," established in 2018, underscores the potential of mobile technology to facilitate the preservation and dissemination of cultural heritage. This association highlights the role of m-learning platforms in making cultural heritage accessible to wider audiences [53]. The intersection of these keywords suggests research opportunities in developing m-learning applications that enable users to engage with and learn from cultural heritage materials innovatively.

4. CONCLUSION

The bibliometric study on e-learning, culture, and tradition reveals significant findings, indicating a notable increase in research productivity over time. Noteworthy academic institutions are crucial in advancing research in these domains, contributing significantly to scholarly knowledge. Highly referenced articles establish a solid foundation for subsequent investigations into the intersection of e-learning, culture, and tradition. Keywords like "mobile learning," "e-learning," "cultural heritage," "augmented reality," and "distance learning" underscore the dynamic nature of the educational field, emphasising the importance of exploring novel methodologies that integrate digital resources, preserve cultural heritage, and adapt to evolving educational environments. Correlations between keywords highlight the multidisciplinary nature of this subject, emphasising the need for research that effectively merges technological advancements with cultural awareness.

The bibliometric examination of e-learning, culture, and tradition yields valuable insights; nonetheless, it is crucial to note the limitations inherent in this approach, as they may affect the interpretation and generalizability of the findings. The analysis relies on published articles within the chosen databases, namely WoS and Scopus. There is a possibility that the database may not include unpublished or non-indexed papers, which could result in a bias in the portrayal of research efforts within the discipline. The

analysis conducted in this study is quantitative, with a specific focus on the frequency of publishing and the number of citations received. Nevertheless, it cannot naturally consider the publications' calibre, influence, or meticulousness, all of which are equally crucial facets of scientific inquiry.

The study's findings provide significant insights into the expansion and interconnectedness of e-learning, culture, and tradition. These findings offer valuable guidance for researchers, educators, and policymakers in developing culturally sensitive and technologically creative educational strategies. Future studies should prioritise the preservation of cultural heritage through the utilisation of technology. Additionally, there is a need to develop pedagogical approaches that promote cross-cultural understanding. Furthermore, enhancing teacher training programmes to ensure educators possess cultural sensitivity is crucial. Lastly, there is a need to investigate emerging trends in e-learning and technology to enhance the integration of these fields with cultural heritage preservation and cross-cultural education.

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APPENDIX

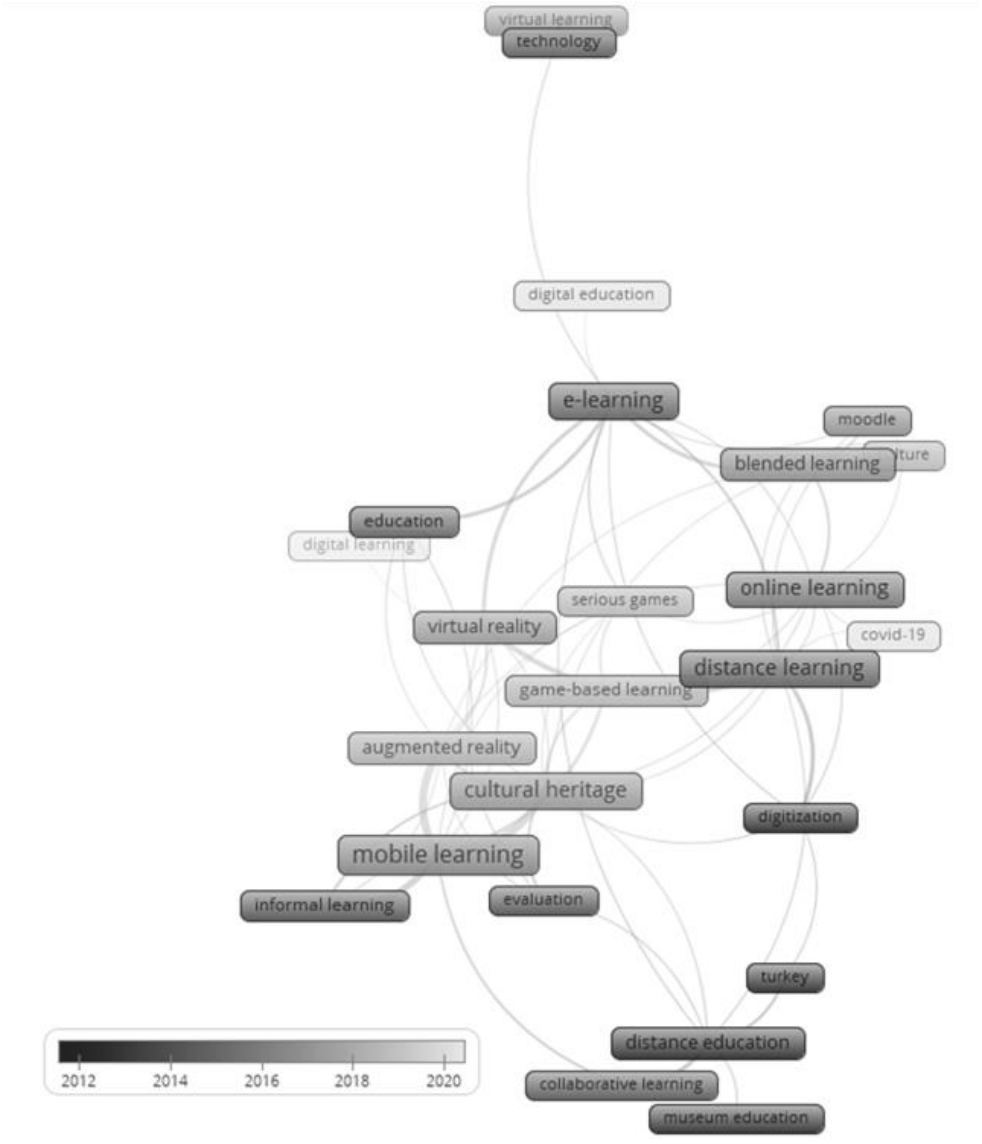


Figure 4. The overlay visualization of authors' keyword

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