Online-Journals.org

iJIM International Journal of Interactive Mobile Technologies

iJIM | eISSN: 1865-7923 | Vol. 17 No. 17 (2023) | OPEN ACCESS

https://doi.org/10.3991/ijim.v17i17.39121

PAPER

Evaluating Future Trends of Digital Storytelling in Higher Education: A Bibliometric Analysis

Yali Tian(✉), Norbayah Mohd Suki

Universiti Utara Malaysia, Kedah, Malaysia

tian_yali@ahsgs.uum.edu.my

ABSTRACT

Digital storytelling has proven to be a pedagogy that can enhance learners' motivation and multiple competencies. However, there is a lack of conceptual research on digital storytelling in higher education. This study aims to assess the trends of digital storytelling in higher education through bibliometric analysis. The PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) procedure was used to extract data from the Scopus and Web of Science databases. A thorough review was conducted to classify and rank the relevant literature on digital storytelling in higher education. The result shows that research on digital storytelling in higher education is increasing annually, but there are significant regional and disciplinary gaps at the higher education level. The main findings of this study are helpful for practitioners and researchers to understand better the current state of research on digital storytelling in higher education and to provide directions for future research.

KEYWORDS

digital storytelling, multimedia learning, pedagogy, bibliometric analysis, future trends in learning

1 INTRODUCTION

Digital technology has transformed people's lives in the era of Industry 4.0, as its application in education is ubiquitous, apart from various fields such as multimedia classrooms, distance learning, online learning, and blended education. During the COVID-19 pandemic, online education using digital technology became the primary method for students to take online courses [1], [2]. This has had a considerable impact on education [3]. However, updating teaching technologies places new demands on teaching methods and traditional pedagogy to be innovative [4], [5], [6], [7], [8]. In this way, the benefits of information technology for higher education become evident [9]. The students were facilitated with digital education during the pandemic, which was required to improve their learning [10]. Digital education has

Tian, Y., Mohd Suki, N. (2023). Evaluating Future Trends of Digital Storytelling in Higher Education: A Bibliometric Analysis. *International Journal of Interactive Mobile Technologies (iJIM)*, 17(17), pp. 121–133. https://doi.org/10.3991/ijim.v17i17.39121

Article submitted 2023-02-24. Revision uploaded 2023-07-10. Final acceptance 2023-07-10.

influenced students' learning with modern tools [11], [12], [13]. Teachers use reliable modern technologies for better learning [14], [15], [16].

In today's world, educators use digital storytelling, a product of information technology, not only as an application of technological tools but also as a pedagogy [17]. Digital storytelling is a logical way of organizing images, videos, texts, recordings, music, etc., to convey information on a topic or theme, usually several minutes long, with a specific appeal and point of view [18], [19]. Shahid and Khan [20] pointed out that digital storytelling is helpful for students to improve their learning for better performance after utilizing digital learning tools. Meanwhile, Munajah, et al. [21] also confirmed that digital storytelling is appropriate for improving the students' writing skills. According to Husaeni and Nandiyanto, [22], the number of publications in digital storytelling in education is increasing. As a pedagogy, researchers have used digital storytelling in various disciplines, such as language teaching, mathematics, writing, technology, and vocational education [23]. These studies offer a variety of benefits to learners, such as improving academic performance [24], increasing motivation to learn [25], improving problem-solving skills [26], and enhancing students' cultural awareness and identity [27], etc. The research by Batur and Çakıroğlu [28] demonstrated that digital storytelling has an impact on aggregate reasoning; Nair and Yunus [29] highlighted that digital storytelling is helpful in speaking skills improvement, and Kendrick, et al. [30] highlighted the importance of digital storytelling for digital literacy learning.

Bibliometric analysis allows researchers and practitioners to capture current research trends and existing evidence in the field [31]. Applying this technique has shown that publications on digital storytelling in education are divided into three categories, spread across several databases. The first category is reviews that are subject-specific. For example, there are reviews on language learning [32], [33], healthcare [34], ageing [35], etc. However, these studies have disciplinary limitations and need to be generalizable. The second category is studies that look at the characteristics of a group in a particular region. For example, Purnama, et al. [36] summarize the use of digital storytelling in early childhood in Indonesia by a literature review study, but it has limitations of the context. Aumgri and Apirating [37] concluded that digital storytelling impacts Thai students' digital skills. Moreover, Al-Abdullatif [38] highlighted the importance of digital storytelling in the education system of Saudi Arabia.

The third category is macro-reviews. Wu and Chen [1] conducted a bibliometric analysis to provide a holistic analysis of digital storytelling in education, how it has been used, and what it has done. Rodríguez, et al. [32] summarized the cultural identity characteristics of digital storytelling in education using a bibliometric approach. Quah and Ng [23] identified quality standards for the design of authoring tools and summarized them as design principles for digital storytelling. However, previous studies have limitations in that they have captured these publications at a macro level and have not yet considered the specific characteristics of learners at different levels.

Furthermore, Lim, et al. [34] conducted a literature review study to understand the role of digital storytelling in language learning for adolescents and adults. However, this study has limitations as it does not cover higher education students. To address this gap, this study aims to assess trends of digital storytelling in higher education through a bibliometric analysis.

A study by Austen, et al. [2] showed that digital storytelling has greater potential for use in higher education regarding students' actions and thinking skills. In addition to digital storytelling, Zourmpakis, et al. [39] reported that adaptive gamification significantly supports student learning. Papadakis, et al. [40] and Papadakis, et al. [41] emphasized that bright screen technologies are helpful for learning. On the other hand, students in higher education have fewer opportunities for digital storytelling.

On the other hand, Kukul [42] highlighted that it is difficult for teachers to share knowledge with learners appropriately without digital storytelling. This lack of digital storytelling is uncomfortable for learners as it poses a problem for their way of learning [43]. At the same time, it is also problematic for educators to understand the tools that can be used effectively to enhance student learning in higher education [44]. The above studies have contributed much to the literature on digital storytelling, but there is no comprehensive literature describing the role of digital storytelling in higher education. At the same time, the practice of digital storytelling in higher education is only marginally addressed.

Accordingly, this study answers the research question: what are the trends of digital storytelling in higher education? The findings provide essential contributions that enable practitioners and researchers to understand the current state of research in digital storytelling, including existing experiences and methods, and to identify the research gaps in this study.

2 METHODOLOGY

A bibliometric analysis of digital storytelling for higher education is conducted as it is recognized as the most critical method to understand the state of knowledge in the field through a scientific and precise approach [31]. Compared to traditional narrative literature reviews, bibliometric analysis as a modern technique replaces individual subjective perceptions with objective data that can remove the limitations imposed by the researcher's perspective and personal bias, making it more informative [45]. Previous studies on digital storytelling in higher education span multiple disciplines, research methods, and regions. On the other hand, bibliometric analysis allows authors to objectively analyze data on these phenomena and thus draw meaningful conclusions. Accordingly, this study explores the trends of digital storytelling in higher education in four steps. First, a search strategy was presented to ensure the reliability of the data sources. Second, the criteria for data selection were presented. Thirdly, the procedure for assessing the quality of the data was presented. Finally, the data analysis procedure is explained.

2.1 Identification of sources

Publication data on digital storytelling for higher education was extracted from Scopus and Web of Science databases. The authors searched the literature for the words "digital storytelling" in the title, abstract, and keywords. In addition, "higher education", "university", "university", or "tertiary education" were used as additional qualifiers to ensure that the content of the published article fell within the scope of tertiary education. The subject area and period of the literature were not restricted. The study is limited to journal articles and excludes other documents such as literature reviews and conference papers. The language was restricted to English. All data were searched from January 2023.

2.2 Criteria and assessment

The PRISMA Statement 2020 [46] was applied, with the search revolving around digital storytelling in higher education and focusing on disciplinary educational

research, i.e. understanding digital storytelling as pedagogy. Specifically, the first step was identifying 154 records from the Scopus database and 104 from the Web of Science database. After cleaning the data from both databases, the authors excluded 65 duplicates using Excel. The researchers exclude literature with duplicate titles to ensure the quality of this review (see Figure 1). The next step is to screen the data. First, literature that is not freely available is excluded, leaving 61 records. The authors then examined the content of the articles to ensure they were relevant to education and excluded those that focused on other research areas, such as ageing and refugees.

The final step was to ensure that the articles focused on higher education and that digital storytelling was used as a pedagogical topic. First, articles that did not focus on higher education were excluded, such as vocational education, K12 education, adult education, etc. Then, articles that were conducted with students but did not examine digital storytelling as a research variable were excluded. Finally, articles that examined the ontology of digital storytelling were also excluded. However, a closer reading reveals that they merely validate some possibilities of digital storytelling rather than applying it as a pedagogy to a discipline. That is, articles on the ontology of digital storytelling need to be excluded, including studies that explore the benefits of digital storytelling in education. For example, Prada [47] shows that digital storytelling in cross-linguistic contexts contributes to a more equitable educational environment for linguistic minorities and racialized multilingual. Figure 1 shows the process of data filtering.

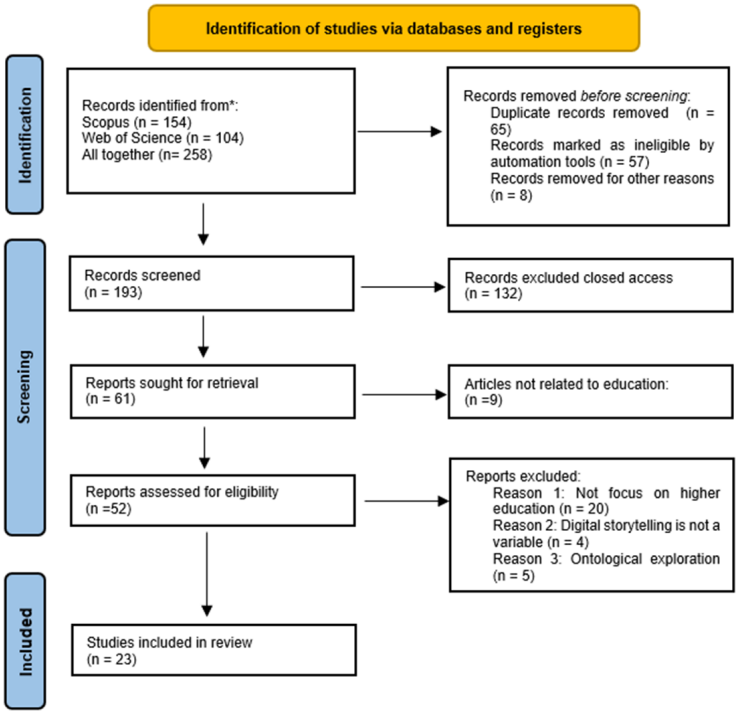

Fig. 1. Flow diagram of the data extraction

Source: Page MJ, et al. (2020).

2.3 Analysis process

This study demonstrates the application of digital storytelling as pedagogy at the university level. To ensure the authority and completeness of the data, the authors

extracted the data from Scopus and Web of Science. First, the data were identified using the database refinement values to export the relevant data. Second, the exported data were merged and cleaned using Excel. However, some articles must be checked for duplicate values due to formatting or punctuation issues, so multiple manual checks can make the data more accurate. Finally, the retained articles were reviewed in depth by different authors and discussed in different rounds to ensure that the focus of the articles was on the context of applying digital storytelling as a disciplinary pedagogy in higher education. From this, 24 articles were extracted.

3 RESULTS

This section presents research trends in four dimensions: Trends in publication output, country distribution, disciplinary distribution, and methods. Understanding these four dimensions would highlight significant findings in the literature and for practitioners.

3.1 Year of publication

The development of digital storytelling began in the 1990s and has gradually spread to various fields [48]. Digital storytelling in education was explored at the beginning of this century [49]. However, it is clear from the data that research into digital storytelling in education started late (see Figure 2). The earliest documented dataset is from 2013; no new findings appeared in the following two years. It was not until 2016 that research findings became consistently available, although only one or two empirical articles were published yearly. In the last three years, research interest has increased significantly. Four articles were published in 2020 and 8 in 2021. Research on digital storytelling in higher education is a new research hotspot.

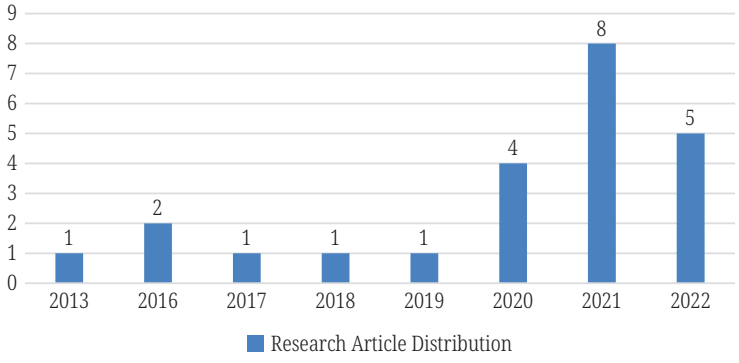

Fig. 2. Year of publication

3.2 Country distribution

The country where the most research is done on digital storytelling is the United States, followed by the United Kingdom and Australia [22]. However, Table 1 shows a different picture. Specifically in higher education, Australia had the most research papers with eight articles, followed by the United Kingdom with 3, and Norway and Thailand with 2. In contrast, only one empirical research paper could be found in the United States. In total, 18 countries were involved in the available studies,

including four co-authored cross-national papers. This suggests that many countries need to pay more attention to research on using digital storytelling in higher education. There is less empirical evidence on digital storytelling as pedagogy in higher education, and more research gaps need to be addressed in this area.

Table 1. Country distribution

Country	Publications
Australia	6
United Kingdom	3
Norway	2
Thailand	2
China	1
Ecuador	1
France	1
Greece	1
Indonesia	1
Philippines	1
Portugal	1
Russia	1
Saudi Arabia	1
Singapore	1
Slovenia	1
Spain	1
Turkey	1
United States	1

3.3 Subject area

Figure 3 shows that 12 disciplines use digital storytelling as a pedagogy at the university level, including social sciences, computer science, medicine, education, engineering, multidisciplinary, health professions, psychology, environmental sciences, arts and humanities, mathematics, economics, management, and accounting. Among these disciplines, the social sciences have the largest share, with 19 articles. It is important to note that seven articles belong to two or more disciplines simultaneously. For example, the article entitled "Digital Storytelling in Sports Narrations: Employing Audiovisual Tools in Sports Journalism Higher Education Course" belongs to Computer Science, Health Professions, Psychology, and Social Sciences in the Subject Area section of the Scopus database. Assume that an article belongs to more than one subject area at the same time in the subject area classification of Scopus and Web of Science. These articles are calculated according to the number of fields in this case. As can be seen in Figure 3, digital storytelling as a higher education pedagogy is more studied in the social sciences than in other fields. The data from the other fields, such as computer science and environmental science, amount

to 1 or 2 articles, much less than in the social sciences. The analysis has shown that digital storytelling has excellent research potential in many disciplines.

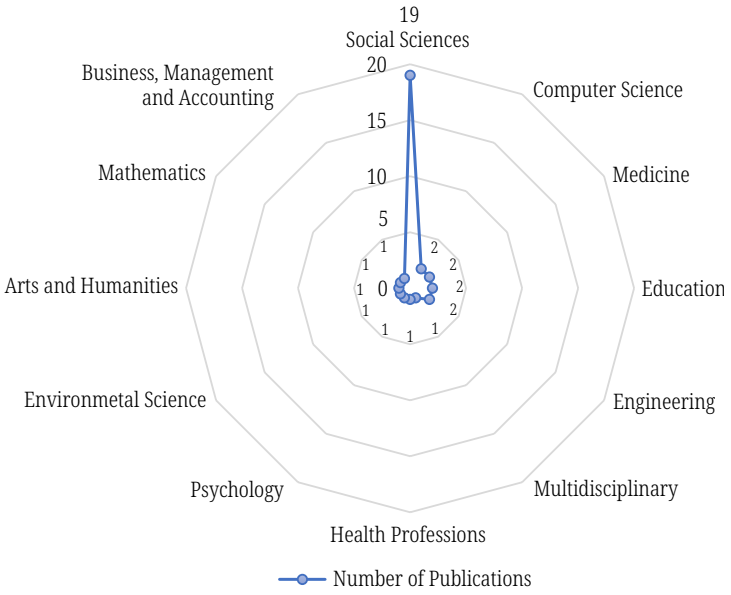

Fig. 3. Subject area contribution

3.4 Research design

Table 2 shows that quantitative research is the least used (only 4 out of 23), while mixed methodology is the most used (10 out of 23). To increase the persuasiveness of the data, researchers tend to confirm the reliability of their studies in both the qualitative and quantitative dimensions. Therefore, the mixed research method is strongly preferred by researchers. On the other hand, qualitative research has been criticized because it is generally considered subjective to the researcher [50]. As the field of research expands, the choice of research methods should be diversified and not limited to traditional research methods.

Table 2. Methodology

Research Methodology	Total
Quantitative method	9
Qualitative method	4
Mixed method	10

4 DISCUSSION

This study examined the trends of digital storytelling in higher education. This study addressed the research question: what are the research trends in digital storytelling for higher education? In the age of Industry 4.0, higher education needs to be supported by digital technology [51], [52]. Digital storytelling as a pedagogy combines technology, engagement, and entertainment and enables students to learn

and develop deep thinking skills in an active exploration process [53], [54], [55]. Previous studies have shown that the barriers to digital storytelling in practice are technological issues and student autonomy [56], [57], [58], [59]. The research by Dogan and Robin [60] reported the competency of a teacher as a barrier in the way of digital storytelling implementation, and the study by Panchenko [61] established the lack of resources and resistance to innovation as a barrier to digital storytelling. Undoubtedly, higher education learners are in a difficult situation regarding their technical and intellectual abilities [62], [63].

Meanwhile, Yuksel-Arslan, et al. [64] highlighted the innovative adoption of teachers as a barrier to practicing digital storytelling in the classroom. In the same way, Lal, et al. [65] demonstrated that digital storytelling can become ineffective when it is not considered an innovative tool for brilliant teaching in the classroom. Accordingly, Clarke and Adam [66] highlighted that digital storytelling applications or practices have barriers even in developed countries like Australia. Furthermore, Christiansen and Koelzer [67] established that the innovation adoption approach is reasonable to improve the digital storytelling application in English as a foreign language learning class. Ryan and Aasetre [68] explained that the engagement of students is a critical factor that can improve digital storytelling practice in the classroom. This means that digital storytelling as a pedagogy in higher education has inherent advantages over other learners, e.g., in K12 education.

Based on the PRISMA method, this study screens data from the Scopus and Web of Science databases to assess the trends of digital storytelling in higher education based on four dimensions: research intensity, country distribution, subject area, and methodology. The analysis of these dimensions provides information on the intensity of research in digital storytelling for higher education, the countries where the studies were geographically conducted, the subject area covered in these studies, and the methodologies used. In this way, the aim of this research is achieved as trends in digital storytelling research are analyzed from a higher education perspective. Importantly, this systematic literature review eliminates personal bias and presents the current state of research objectively and concisely. It facilitates researchers to quickly and accurately understand research trends and contributes to the development of digital storytelling in higher education so that more learners can benefit from this pedagogy, which is the aim of this study.

5 CONCLUSION AND FUTURE RESEARCH DIRECTION

This study makes an essential contribution to research, as few studies have looked at the trends of digital storytelling in higher education. Indeed, the development of educational tools is necessary in today's world, but minimal studies have been conducted on this topic. These trends may be helpful for researchers to understand the areas and gaps already discussed in literature. Moreover, practitioners could understand the importance of digital storytelling. In short, this study provides a systematic literature review of digital storytelling as a pedagogy for higher education by analyzing the trends based on four dimensions: publication trends, country distribution, disciplinary distribution, and methodologies. In this way, it can promote understanding of the current situation and trends of digital storytelling in higher education. This study shows that:

1. Only 23 significant articles were identified by extracting literature from the Scopus and Web of Science databases.

2. Interest in using digital storytelling in higher education has continued unabated since 2013, with a faster growth rate in the last three years.
3. Regarding the field, only 18 countries are involved in research on this topic, with Australia having the highest research output, followed by the UK, Norway, and Thailand.
4. Research on digital storytelling in sociology stands far above other disciplines.
5. In terms of research methods, mixed research methods were used most often, and quantitative research methods least often.

The above results show that digital storytelling as a pedagogy is receiving more and more attention at the higher education level. However, in most countries, it is still in its infancy and has excellent potential. Digital storytelling in higher education has had a late start but is rising. Future research can draw on the experiences of countries like Australia to conduct localized research and fill in the regional gaps. Meanwhile, it has been noted that most publications appear in the social sciences, while there are research gaps in other disciplines. Therefore, future research can draw on the social sciences experience and conduct empirical research in their field to assess the role of digital storytelling in higher education in their regions.

Finally, in terms of research methodology, mixed and qualitative research methods have often been used in research on digital storytelling. This is directly related to the nature of discipline in the social sciences. Other disciplines may opt for quantitative and other methods, such as design research. Future researchers can conduct targeted research to identify regional and disciplinary gaps using various methods that would be useful in contributing essential insights to advancing the literature on digital storytelling.

6 REFERENCES

[1] Wu, J., & Chen, D. T. V. (2020). A systematic review of educational digital storytelling. Computers & Education, 147, 103786. https://doi.org/10.1016/j.compedu.2019.103786

[2] Austen, L., Pickering, N., & Judge, M. (2021). Student reflections on the pedagogy of transitions into higher education, through digital storytelling. Journal of Further and Higher Education, 45(3), 337–348. https://doi.org/10.1080/0309877X.2020.1762171

[3] Zhou, L., Wu, S., Zhou, M., & Li, F. (2020). 'School's out, but class's on', the largest online education in the world today: Taking China's practical exploration during the COVID-19 epidemic prevention and control as an example. Best Evidence in Chinese Education, 4(2), 501–519. https://doi.org/10.15354/bece.20.ar023

[4] Li, Q., Li, Z., & Han, J. (2021). A hybrid learning pedagogy for surmounting the challenges of the COVID-19 pandemic in the performing arts education. Education and Information Technologies, 26(6), 7635–7655. https://doi.org/10.1007/s10639-021-10612-1

[5] Obloberdiyevna, D. S., & Tuychiyevna, R. L. (2022). Distance learning in the system of higher education. Web of Scholars: Multidimensional Research Journal, 1(4), 53–59. https://www.innosci.org/wos/article/view/65

[6] Zirawani Baharum, Faradina Ahmad, Muhammad Imran Qureshi, Nasien, D., & Adiya, M. H. (2023). Mobile-based applications: The legal challenges on data privacy. International Journal of Online and Biomedical Engineering (iJOE), 19(9), 4–14. https://doi.org/10.3991/ijoe.v19i09.40915

[7] Nor Intan Shamimi Abdul Aziz, Dilla Syadia Ab Latiff, Siti Noorsuriani Maon, & Annurizal Anuar. (2023). Mobile learning in medical coding course: Intention to use MedCoS. International Journal of Online and Biomedical Engineering (iJOE), 19(9), 15–29. https://doi.org/10.3991/ijoe.v19i09.40913

[8] Karagianni, E., & Drigas, A. (2023). New technologies for inclusive learning for students with special educational needs. International Journal of Online and Biomedical Engineering (iJOE), 19(5), 4–21. https://doi.org/10.3991/ijoe.v19i05.36417
[9] Bradwell, P. (2009). Book review – The edgeless university – Why higher education must embrace technology. Software World, 40(4), 10.
[10] Chakraborty, P., Mittal, P., Gupta, M. S., Yadav, S., & Arora, A. (2021). Opinion of students on online education during the COVID-19 pandemic. Human Behavior and Emerging Technologies, 3(3), 357–365. https://doi.org/10.1002/hbe2.240
[11] Aderibigbe, S. A., Alotaibi, E., & Alzouebi, K. (2023). Exploring the impact of peer mentoring on computer-supported collaborative learning among undergraduate students. International Journal of Emerging Technologies in Learning (iJET), 18(13), 4–20. https://doi.org/10.3991/ijet.v18i13.39819
[12] Pham, D. T., & Nguyen, T. H. H. (2023). University students' perceptions of google tools in learning English courses online. International Journal of Emerging Technologies in Learning (iJET), 18(13), 45–61. https://doi.org/10.3991/ijet.v18i13.39857
[13] Liao, Y. (2023). Effects of immersive virtual reality technology on online learning outcomes. International Journal of Emerging Technologies in Learning (iJET), 18(13), 62–73. https://doi.org/10.3991/ijet.v18i13.41201
[14] Tahiri, A., Chikhaoui, A., Assermouh, J., Halim, M., & Benfares, S. (2023). Contribution of online tutoring in promoting the quality of distance learning for Moroccan teachers. International Journal of Engineering Pedagogy (iJEP), 13(5), 104–120. https://doi.org/10.3991/ijep.v13i5.34047
[15] Carrión-Robles, F., Espinoza-Celi, V., & Vargas-Saritama, A. (2023). The use of augmented reality through Assemblr Edu to inspire writing in an Ecuadorian EFL distance program. International Journal of Engineering Pedagogy (iJEP), 13(5), 121–141. https://doi.org/10.3991/ijep.v13i5.38049
[16] Kersánszki, T., Holik, I., & Márton, Z. (2023). Minecraft game as a new opportunity for teaching renewable energy topics. International Journal of Engineering Pedagogy (iJEP), 13(5), 16–29. https://doi.org/10.3991/ijep.v13i5.36287
[17] Barber, J. F. (2016). Digital storytelling: New opportunities for humanities scholarship and pedagogy. Cogent Arts & Humanities, 3(1), 1181037. https://doi.org/10.1080/23311983.2016.1181037
[18] Marshall, D. J., Smaira, D., & Staeheli, L. A. (2022). Intergenerational place-based digital storytelling: A more-than-visual research method. Children's Geographies, 20(1), 109–121. https://doi.org/10.1080/14733285.2021.1916436
[19] Robin, B. R. (2006). The educational uses of digital storytelling. In Proceedings of Society for Information Technology and Teacher Education International Conference 2006 (pp. 709–716). Chesapeake, VA: AACE.
[20] Shahid, M., & Khan, M. R. (2022). Use of digital storytelling in classrooms and beyond. Journal of Educational Technology Systems, 51(1), 63–77. https://doi.org/10.1177/00472395221112599
[21] Munajah, R., Sumantri, M. S., & Yufiarti, Y. (2023). The use of digital storytelling to improve students' writing skills. Advances in Mobile Learning Educational Research, 3(1), 579–585. https://doi.org/10.25082/AMLER.2023.01.006
[22] Al Husaeni, D. F., & Nandiyanto, A. B. D. (2022). Bibliometric using Vosviewer with Publish or Perish (using google scholar data): From step-by-step processing for users to the practical examples in the analysis of digital learning articles in pre and post Covid-19 pandemic. ASEAN Journal of Science and Engineering, 2(1), 19–46. https://doi.org/10.17509/ajse.v2i1.37368
[23] Quah, C. Y., & Ng, K. H. (2022). A systematic literature review on digital storytelling authoring tool in education: January 2010 to January 2020. International Journal of Human–Computer Interaction, 38(9), 851–867. https://doi.org/10.1080/10447318.2021.1972608

[24] Aljaraideh, Y. A. (2020). The impact of digital storytelling on academic achievement of sixth grade students in English language and their motivation towards it in Jordan. Turkish Online Journal of Distance Education, 21(1), 73–82. https://doi.org/10.17718/tojde.690345

[25] Parsazadeh, N., Cheng, P. Y., Wu, T. T., & Huang, Y. M. (2021). Integrating computational thinking concept into digital storytelling to improve learners' motivation and performance. Journal of Educational Computing Research, 59(3), 470–495. https://doi.org/10.1177/0735633120967315

[26] Walters, L., Green, M., Goldsby, D., & Parker, D. (2018). Digital storytelling as a problem-solving strategy in mathematics teacher education: How making a Math-eo engages and excites 21st century students. International Journal of Technology in Education and Science, 2(1), 1–16.

[27] Karakuş, M., Türkkan, B. T., & Namlı, N. A. (2020). Investigation of the effect of digital storytelling on cultural awareness and creative thinking. Education & Science/Egitim ve Bilim, 45(203), 309–326. https://doi.org/10.15390/EB.2020.8576

[28] Batur, A., & Çakıroğlu, Ü. (2023). Implementing digital storytelling in statistics classrooms: Influences on aggregate reasoning. Computers & Education, 200, 104810. https://doi.org/10.1016/j.compedu.2023.104810

[29] Nair, V., & Md Yunus, M. (2022). Using digital storytelling to improve pupils' speaking skills in the age of COVID 19. Sustainability, 14(15), 9215. https://doi.org/10.3390/su14159215

[30] Kendrick, M., Early, M., Michalovich, A., & Mangat, M. (2022). Digital storytelling with youth from refugee backgrounds: Possibilities for language and digital literacy learning. TESOL Quarterly, 56(3), 961–984. https://doi.org/10.1002/tesq.3146

[31] Kitchenham, B. (2004). Procedures for performing systematic reviews. Keele, UK: Keele University, 33, 1–26.

[32] Rodríguez, C. L., García-Jiménez, M., Massó-Guijarro, B., & Cruz-Gonzalez, C. (2021). Digital storytelling in education: A systematic review of the literature. Review of European Studies, 13(2), 13–25. https://doi.org/10.5539/res.v13n2p13

[33] Nair, V., & Yunus, M. M. (2021). A systematic review of digital storytelling in improving speaking skills. Sustainability, 13(17), 9829. https://doi.org/10.3390/su13179829

[34] Lim, N. Z. L., Zakaria, A., & Aryadoust, V. (2022). A systematic review of digital storytelling in language learning in adolescents and adults. Education and Information Technologies, 27(5), 6125–6155. https://doi.org/10.1007/s10639-021-10861-0

[35] Stargatt, J., Bhar, S., Bhowmik, J., & Al Mahmud, A. (2022). Digital storytelling for health-related outcomes in older adults: Systematic review. Journal of Medical Internet Research, 24(1), e28113. https://doi.org/10.2196/28113

[36] Purnama, S., Ulfah, M., Ramadani, L., Rahmatullah, B., & Ahmad, I. F. (2022). Digital storytelling trends in early childhood education in Indonesia: A systematic literature review. Jurnal Pendidikan Usia Dini, 16(1), 17–31. https://doi.org/10.21009/JPUD.161.02

[37] Aumgri, C., & Apirating, K. (2022). Digital storytelling media online via gamification model to Promoteof digital literacy skills for undergraduate students in Thailand: A systematic literature review. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 13(2), 143–150.

[38] Al-Abdullatif, A. M. (2022). Towards digitalization in early childhood education: Preservice teachers' acceptance of using digital storytelling, comics, and infographics in Saudi Arabia. Education Sciences, 12(10), 702. https://doi.org/10.3390/educsci12100702

[39] Zourmpakis, A. I., Kalogiannakis, M., & Papadakis, S. (2023). A review of the literature for designing and developing a framework for adaptive gamification in physics education. In The International Handbook of Physics Education Research: Teaching Physics. Melville, New York: AIP Publishing. https://doi.org/10.1063/9780735425712_005

[40] Papadakis, S., Kalogianakis, M., Sifaki, E., & Monnier, A. (2021, November). The impact of smart screen technologies and accompanied apps on young children learning and developmental outcomes. In Frontiers in Education (Vol. 6, p. 790534). Frontiers. https://doi.org/10.3389/feduc.2021.790534

[41] Papadakis, S., Alexandraki, F., & Zaranis, N. (2021). Greek parents' app choices and young children's smart mobile usage at home. In Interactive Mobile Communication, Technologies and Learning (pp. 39–50). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-96296-8_4

[42] Kukul, V. (2023). Should I use digital storytelling in my future classroom? Why or why not? Investigating pre-service math teachers' acceptance of digital storytelling. E-Learning and Digital Media, 20427530231156173. https://doi.org/10.1177/20427530231156173

[43] Moradi, H., & Chen, H. (2019). Digital storytelling in language education. Behavioral Sciences, 9(12), 147. https://doi.org/10.3390/bs9120147

[44] Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher educators' use of digital tools and needs for digital competence in higher education. Journal of Digital Learning in Teacher Education, 35(4), 203–220. https://doi.org/10.1080/21532974.2019.1646169

[45] Pati, D., & Lorusso, L. N. (2018). How to write a systematic review of the literature. HERD: Health Environments Research & Design Journal, 11(1), 15–30. https://doi.org/10.1177/1937586717747384

[46] Rethlefsen, M. L., Kirtley, S., Waffenschmidt, S., Ayala, A. P., Moher, D., Page, M. J., & Koffel, J. B. (2021). PRISMA-S: An extension to the PRISMA statement for reporting literature searches in systematic reviews. Systematic Reviews, 10(1), 1–19. https://doi.org/10.1186/s13643-020-01542-z

[47] Prada, J. (2022). Articulating translanguaging as pedagogy of empowerment for racialized, LanguageMinoritized bilinguals: From concepto to proyecto through digital storytelling. TESL Canada Journal, 38(2), 171–185. https://doi.org/10.18806/tesl.v38i2.1353

[48] Couldry, N. (2008). Mediatization or mediation? Alternative understandings of the emergent space of digital storytelling. New Media & Society, 10(3), 373–391. https://doi.org/10.1177/1461444808089414

[49] Thompson Long, B., & Hall, T. (2018). Educational narrative inquiry through design-based research: Designing digital storytelling to make alternative knowledge visible and actionable. Irish Educational Studies, 37(2), 205–225. https://doi.org/10.1080/03323315.2018.1465836

[50] Gillani, D. (2021). Can and "should" qualitative research be value-free? Understanding the epistemological tussle between positivists and interpretivists. Journal of Political Studies, 28(1), 181–192.

[51] Nodira, T., & Rashid, X. (2022). Problems of innovation management in the higher education system. Web of Scientist: International Scientific Research Journal, 3(11), 155–164.

[52] Muñoz, J. L. R., Ojeda, F. M., Jurado, D. L. A., Peña, P. F. P., Carranza, C. P. M., Berríos, H. Q., ... & Vasquez-Pauca, M. J. (2022). Systematic review of adaptive learning technology for learning in higher education. Eurasian Journal of Educational Research, 98(98), 221–233.

[53] Fu, J. S., Yang, S. H., & Yeh, H. C. (2022). Exploring the impacts of digital storytelling on English as a foreign language learners' speaking competence. Journal of Research on Technology in Education, 54(5), 679–694. https://doi.org/10.1080/15391523.2021.1911008

[54] Belda-Medina, J. (2022). Promoting inclusiveness, creativity and critical thinking through digital storytelling among EFL teacher candidates. International Journal of Inclusive Education, 26(2), 109–123. https://doi.org/10.1080/13603116.2021.2011440

[55] Matsiola, M., Spiliopoulos, P., & Tsigilis, N. (2022). Digital storytelling in sports narrations: Employing audiovisual tools in sport journalism higher education course. Education Sciences, 12(1), 51. https://doi.org/10.3390/educsci12010051

[56] Çakıroğlu, Ü., Saylan, E., Çevik, İ., & Özkan, A. (2022). Qualifying with different types of quizzes in an online EFL course: Influences on perceived learning and academic achievement. International Review of Research in Open and Distributed Learning, 23(3), 191–211. https://doi.org/10.19173/irrodl.v23i3.5894

[57] Lukitasari, M., Murtafiah, W., Ramdiah, S., Hasan, R., & Sukri, A. (2022). Constructing digital literacy instrument and its effect on college students' learning outcomes. International Journal of Instruction, 15(2), 171–188. https://doi.org/10.29333/iji.2022.15210a

[58] Özkaya, P. G. (2022). Investigating research trends on digital storytelling: A bibliometric and visualized analysis. International Journal of Progressive Education, 18(1), 379–396.

[59] Olugbara, C. T., Letseka, M., & Olugbara, O. O. (2022). A systematic review of digital storytelling as educational tool for teaching and learning in Southern Africa. In Multimodal Learning Environments in Southern Africa (pp. 165–195). https://doi.org/10.1007/978-3-030-97656-9_9

[60] Dogan, B., & Robin, B. (2008, March). Implementation of digital storytelling in the classroom by teachers trained in a digital storytelling workshop. In Society for Information Technology & Teacher Education International Conference (pp. 902–907). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

[61] Panchenko, L. (2021). Digital storytelling in adult education: barriers and ways to overcome them. Educational Technology Quarterly, 2021(4), 673–688. https://doi.org/10.55056/etq.41

[62] Planer, R., Wolf, C., & Godulla, A. (2022). Digital storytelling beyond flagship projects: Exploring multimedia work routines in higher education practical training. Journalism Practice, 16(6), 1247–1264. https://doi.org/10.1080/17512786.2020.1832140

[63] Udeogalanya, V. (2022). Aligning digital literacy and student academic success: Lessons learned from COVID-19 pandemic. International Journal of Higher Education Management, 8(2). https://doi.org/10.24052/IJHEM/V08N02/ART-4

[64] Yuksel-Arslan, P., Yildirim, S., & Robin, B. R. (2016). A phenomenological study: Teachers' experiences of using digital storytelling in early childhood education. Educational Studies, 42(5), 427–445. https://doi.org/10.1080/03055698.2016.1195717

[65] Lal, S., Donnelly, C., & Shin, J. (2015). Digital storytelling: An innovative tool for practice, education, and research. Occupational Therapy in Health Care, 29(1), 54–62. https://doi.org/10.3109/07380577.2014.958888

[66] Clarke, R., & Adam, A. (2012). Digital storytelling in Australia: Academic perspectives and reflections. Arts and Humanities in Higher Education, 11(1–2), 157–176. https://doi.org/10.1177/1474022210374223

[67] Christiansen, M. S., & Koelzer, M. L. (2016). Digital storytelling: Using different technologies for EFL. MexTESOL Journal, 40(1), 1–14.

[68] Ryan, A. W., & Aasetre, J. (2021). Digital storytelling, student engagement and deep learning in Geography. Journal of Geography in Higher Education, 45(3), 380–396. https://doi.org/10.1080/03098265.2020.1833319

7 AUTHORS

Yali Tian, Universiti Utara Malaysia, Kedah, Malaysia.
Norbayah Mohd Suki, Universiti Utara Malaysia, Kedah, Malaysia.