

A bibliometric analysis of digital storytelling in language education

Ayşegül Avcı¹

Yusuf Kasımi²

¹Eskişehir Technical University, Turkey / Contact: aysenuravci26@gmail.com 

²Düzce University, Turkey / Contact: yusuf_kasimi@yahoo.com 

Abstract

This study provides a comprehensive overview of the research in digital storytelling and identifies the key themes and trends in this area. Digital storytelling is an emerging field that has gained significant attention in recent years. In this study, we conducted a bibliometric analysis of the digital storytelling literature to examine this field's growth and development. The data collected from the Web of Science database was analyzed quantitatively, revealing a significant growth in digital storytelling as a field in recent years. The analysis revealed that the number of publications in this area has noticeably increased. The field's most productive authors, journals, and institutions were identified, and the key themes, trends, and challenges in digital storytelling research were identified. The analysis revealed that the most frequent keywords in the literature were "technology," "literacy," "education," "language," "students," "learning-motivation," "pedagogy," "English," and "stories." The key themes that emerged from the literature were the use of digital storytelling in education, the role of technology in digital storytelling, and the use of digital storytelling for social change. The co-occurrence of keywords revealed strong connections between the themes of education, learning, and technology in digital storytelling research. The analysis also revealed that the field of digital storytelling had grown rapidly in recent years, with a significant increase in the number of publications. The number of publications in digital storytelling has increased exponentially in the last decade, and this trend is expected to continue. The analysis also revealed that the majority of publications in digital storytelling are in the subfields of education and English. The analysis revealed that the field of digital storytelling is still in its early stages, and there is a need for more research in this area.

Keywords

Digital Storytelling;
Education;
Bibliometric
Analysis

Submission date

08.05.2023

Acceptance date

24.06.2023

© 2023 The Literacy Trek & the Authors – Published by The Literacy Trek
<https://doi.org/10.47216/literacytrek.1294089>

Introduction

Presenting stories through digital media is a relatively new practice which has received a lot of attention in recent years. The practice of creating, sharing, and disseminating stories using various digital tools and technology is referred to as "digital storytelling" (Robin, 2008, p. 222). Digital storytelling is interdisciplinary and

involves a wide range of fields, including education, communication, media studies, sociology, psychology, and computer science, among others (Sadik, 2008).

Many studies have been conducted on digital storytelling practices in educational settings. Digital storytelling is widely regarded as a practical technological application that uses user-generated content to remove barriers preventing educators from using technology effectively in educational settings. This goal can be accomplished by combining user-generated content with digital storytelling (Robin, 2008). When digital storytelling is included in students' educational experiences, they can participate in more personally relevant learning experience thanks to technology use (Kabaran & Duman, 2021).

Digital storytelling is a method that can be favored in education due to its capacity to appeal to multiple senses through the use of a multimedia environment (Ozkaya, 2020). This ability to appeal to many senses makes digital storytelling preferable in education. Since it incorporates both “text-based” and “audio-based” components, it can consequently help to enhance linguistic abilities (Rance-Roney, 2008, p. 30). In addition, it may be utilized to engage some different senses by incorporating animated and interactive graphics into the presentation. Students' writing skills can be engaged during the construction of a story's text, which is the first stage of digital storytelling (Papadaki et al., 2023) while students' listening skills can be engaged during the stage in which the story is shared, and students' oratory skills can be engaged during the stage when the shared story is interpreted (Sembiring, & Simajuntak, 2023).

Digital storytelling is a multi-stage process that can activate students' creativity in diverse ways. When viewed in this light, we can say that digital storytelling is a method that has multiple dimensions because it can appeal to each student's ability to comprehend (listening, reading), as well as their ability to express themselves (speaking, writing) (Arrobaa & Acostab, 2020; Al Khateeb, 2019; Ertan-Ozen, 2020; Lanszki & Kunos, 2021). Using digital storytelling in the classroom can improve learning outcomes, student engagement, and motivation (Kasami, 2020). Storytelling in digital form can also assist in developing 21st-century skills, such as critical thinking (Yang & Wu, 2012), problem-solving, and digital literacy (Ozen &

Duran, 2019). The use of digital storytelling, which is increasing in various contexts, can provide not only educational settings but also the whole society with enormous benefits (Schmier, 2019).

The apparent potential of digital storytelling reveals that reviewing the relevant literature on that technique may give a more comprehensive understanding of how and why it could be integrated into education programs. Bibliometric analysis is a technique that may be utilized to examine and quantify academic literature that is associated with a specific area (Pritchard, 1969). This kind of analysis can give helpful insights into a field's history and current state. It can also uncover essential players and trends (De Bellis, 2009). The literature on digital storytelling lacks a comprehensive bibliometric analysis of the current state of research and practice, despite its growing popularity. An analysis of this nature could provide valuable insights into identifying trends and patterns in the field and insights into the most influential authors and publications. By providing a comprehensive overview of the state of research on digital storytelling, a bibliometric analysis could help inform future research and practice in this field and aid in developing effective strategies for using digital storytelling in education. Thus, this bibliometric analysis aims to provide a complete overview of the research in digital storytelling and highlight the important topics, trends, and issues in this area.

Despite the growing interest in the topic, there is not yet a review covering all aspects of digital storytelling in educational settings. Some evaluations have been written on digital storytelling, but education is not one of the critical problems these reviews address. For instance, De Jager et al. (2017) looked into the use of digital storytelling as a study approach. Among these was an empirical study that strictly adhered to established scientific norms. However, the vast bulk of the study concentrates on something other than education; consequently, the review is only marginally relevant to the topic at hand. Relevant research reveals that only a limited number of studies have been conducted investigating the growth of research trends for digital storytelling through bibliometrics. That is a significant gap in the body of knowledge. In light of this, the present investigation's purpose was to conduct a search that investigated the Web of Science (WoS) database. Academics interested in working on this topic in educational settings would find a thorough analysis of the worldwide pattern of studies published on the use of digital storytelling in educational

settings a helpful reference. This analysis focuses on the pattern of studies published on the use of digital storytelling in educational settings.

The following research questions have been raised:

1. Which documents, authors, institutions, and countries are most influential in terms of citation counts?
2. What are the most frequent keywords in terms of digital storytelling in education?

Method

Data Selection

We acquired data from WoS, which is one of the most well-known and commonly utilized library resources available today, in order to carry out a complete bibliometric analysis of the research on digital storytelling (Roemer & Borchardt, 2015). When searching for relevant literature, we utilized the following keywords: "digital storytelling," "digital storytelling in education," and "digital storytelling for learning." In the analysis, we only included articles published between 2002 and 2022, and we restricted our search only to include items that had been indexed in the WoS database.

Data Analysis

Afterward, the data was imported into reference management software, cleaned up, and structured by us before being exported again. After that, bibliometric software was utilized to analyze the data. It was possible to glean information from the program, such as the total number of publications, authors, journals, institutions, and countries, as well as citations. In addition, we utilized tools to determine the authors, publications, and institutions in the field of digital storytelling that have produced the most work. After that, we analyzed the data to determine the primary topics and developments in digital storytelling research. In order to conduct an in-depth analysis of the themes, we used qualitative and quantitative research approaches. Biblioshiny (version 2.0) tool, which Biblioshiny designed, assisted data visualization such as journals, researchers, and individual articles. This tool was also utilized to discover the connections between citations, bibliographic coupling, co-citation, and co-

authorship. We analyzed the number of publications that were produced over a certain period in order to determine the expansion of the discipline. In addition, we evaluated the distribution of publications throughout the several subfields of digital storytelling, including education, business, advertising, and social change, among others. Our bibliometric study, taken as a whole, gives an in-depth summary of the research conducted in digital storytelling and identifies the most important topics and developments in this field. Based on the number of times that two different articles were cited together, this network would be able to determine which articles are most closely associated with one another. Analyzing that network would allow us to determine the writers and publications that had the most impact in the digital storytelling field in the time of the study.

Results

Research Productivity

In terms of the number of articles published each year, Figure 1 illustrates the level of research production in the field of digital storytelling in educational settings. Research output on the use of digital storytelling in education has steadily increased since the first publications on the topic appeared in the early decades of the 20th century. Significant growth was between 2015 and 2022, when most publications were generated. 2016 and 2022 ($N = 55$) were the years when the most academic publications were made on that topic, each with 57 totals, respectively. It was determined that the annual growth rate was 22.19%.

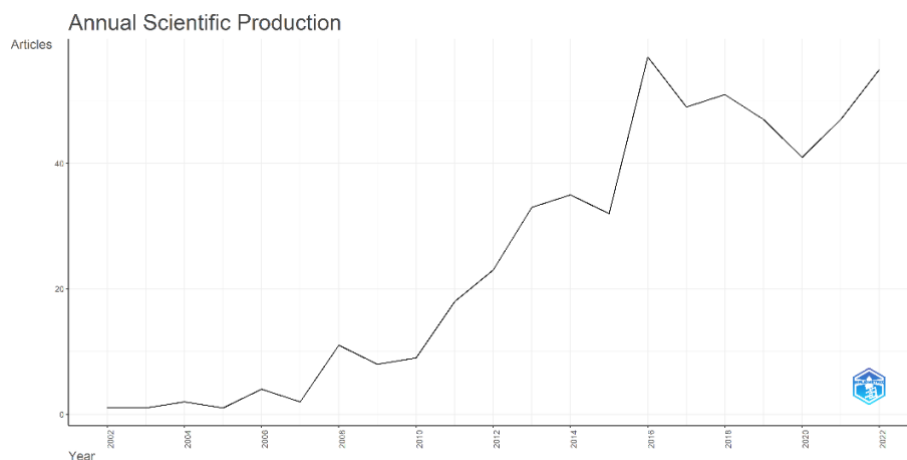


Figure 1. The level of research production in the field of digital storytelling in educational settings

The number of publications about digital storytelling in education featured in WoS is displayed in Table 1. There has been a consistent rise in the number of digital storytelling examples seen in educational publications since the year 2002, according to WoS. That finding implies a potentially more significant rise in the total number of publications of this kind soon. We also noticed that the total number of publications has grown over the years, particularly after 2016. According to these data, the subject has steadily grown throughout the years, but in 2016, it began to garner more attention in terms of publication.

Table 1. The number of the digital storytelling articles

Year	N
2002	1
2003	1
2004	2
2005	1
2006	4
2007	2
2008	11
2009	8
2010	9
2011	18
2012	23
2013	33
2014	35
2015	32
2016	57
2017	49
2018	51
2019	47
2020	41
2021	47
2022	55

Figure 2 displays the specific number of citations received in one year. The year 2008 saw the greatest total number of citations ($M= 86.18$), while 2016 saw the greatest number of documents published ($N= 57$), with an average of 86,18 citations

per piece of writing. The highest number of documents published was in 2016 ($N=57$). The patterns of publishing suggest that there has been a discernible rise in the amount of investigation into the use of digital storytelling in educational settings as time has progressed. The number of citations that are typically included in each article that is cited is 10.98.

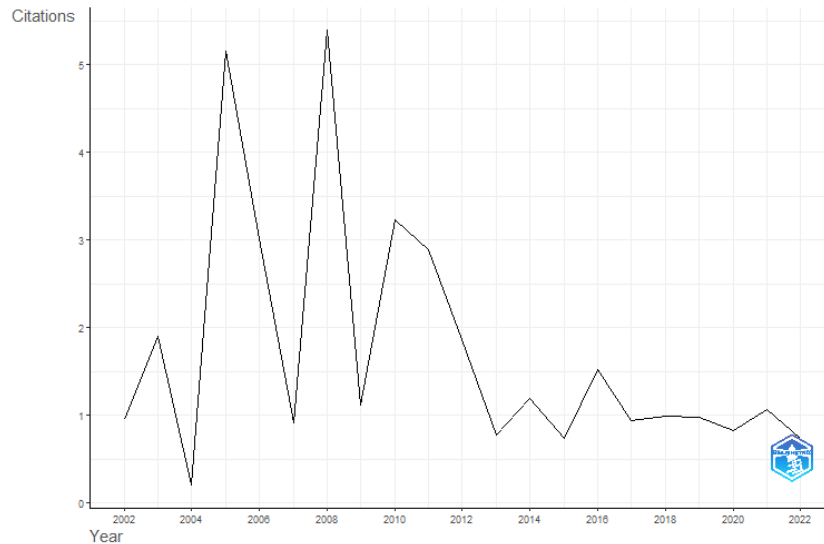


Figure 2. Average citations per year

Leading Countries and Institutions

The top ten countries and organizations for digital storytelling in education research productivity are summarized in Figure 3. This productivity is measured in terms of publications, citations, and the effect of citations. The United States ($N = 143$ publications), China ($N = 67$ publications), and Türkiye ($N = 67$ publications) were the top three countries with the largest total number of publications. South Africa, which occupied the last spot on the list, was responsible for 24 publications. Publications originating in the United States received 2415 citations and an impact score of 16.88. The total number of citations for China was 801, and the country's citation impact was 24.2. Türkiye had the same number of articles as China, but China had a higher number of citations (239), while Türkiye had fewer citations that had an impact (5.6). Even though Italy has a lower publishing rate than other countries, its works have been mentioned 130 times and have a citation impact of 6.2. Among the top 10 countries, Italy had the weakest influence based on the number of citations it received. Oman is the third most-cited country, with a total of 282 citations per year

and an impact score of 8; even though it is not among the top 10 countries, Oman is the most-cited country overall.

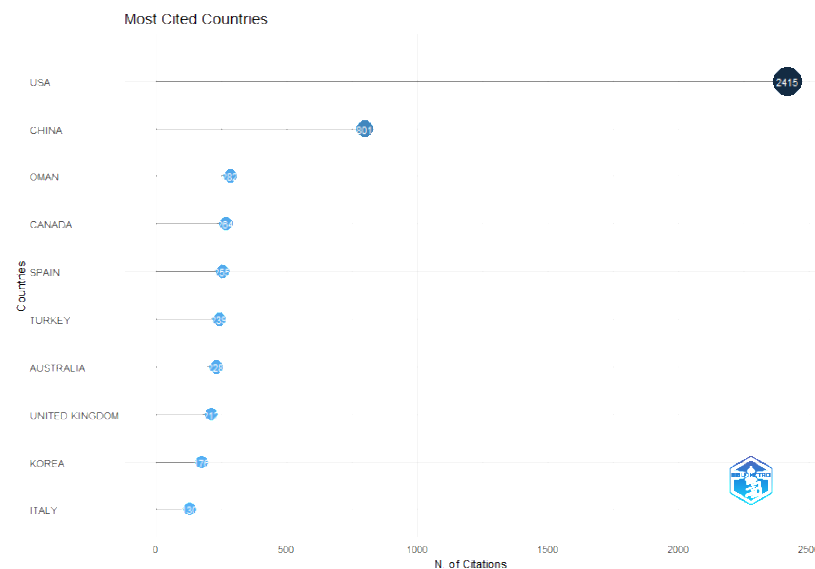


Figure 3. Top ten countries and organizations for digital storytelling in education research productivity

Among the top 10 institutions contributing to the literature on digital storytelling in education, the University of Goldsmiths of London is at the top of the list with 19 publications. That places the institution at the top of the list. The University of Salerno is in third place, followed by the University of Valencia and Cape Peninsula University. Each of these universities has 15 publications to its name (11 publications). The three organizations each contributed ten publications. The Alberta University produced ten papers, which collectively received 123 citations and had a citation impact of 24.6. The number of papers produced by the Universities of Barcelona and Oviedo was the same. The impact of 17 publications by the Goldsmiths University of London has been scored as 4 with 68 citations. Several factors could lead to higher contributions from institutions in industrialized nations. For example, there is a growing interest in digital education and tools in such countries, so educational institutions in industrialized countries may have more opportunities to include digital storytelling in their curriculum.

Table 2. Top 10 institutions contributing to the literature on digital storytelling in education

Organization	Articles
Goldsmiths University London	19
Cape Peninsula University of Technology	15
University of Salerno	11
University of Valencia	11
University of Alberta	10
University of Barcelona	10
University of Oviedo	10
National Central University	9
University of Helsinki	8
Nanyang Technological University	7

Most Productive Authors

The most productive authors in digital storytelling in education research are presented in Figure 4. The author, Macleroy V., has a total of 9 publications, and those articles have been referenced 54 times, giving the author a citation impact of 6, and the author's H index is 4 (the most in the list). Anderson J, Gachago D., and C. Liu authored seven publications, which gives them the second place on the list.

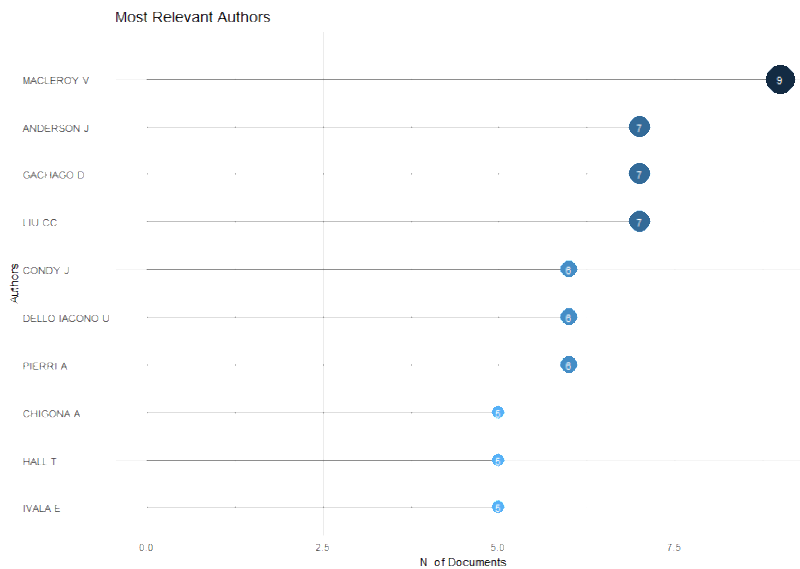


Figure 4. Most productive authors in digital storytelling in education research

Condy J., Dello Iacono U., and Pierri A. share the third place with a total of six publications each, while five authors (Chigona A., Hall T., Ivala E., Perez Med, and Robin Br.) have a total of five papers each.

The article "Digital storytelling: A strong technology tool for the 21st-century classroom" was written by Robin Br. and published in 2008 in the journal *Theory into Practice*. It is now at the top of the list of articles that have received the most citations worldwide. It has 414 citations, an impact factor of 11, and the author's H-index is 7.

Most Influential Journals

The top ten research journals that produced material on digital storytelling use in educational settings are presented in Figure 5 and Table 3. The total number of articles produced by these ten journals came to 36%, with four of the journals producing 91 total publications. *Digital Education Review (Q2)*, which is a journal that features both theoretical and practical works on the use of digital technology in education, and *Multilingual Digital Storytelling (Project, article)* emerged as top sources with a total of 26 publications and 181 citations, followed by the *Educational Technology and Society*, which is a journal that continues to maintain its focus on how learning, teaching, and evaluation are affected by long-term technology applications, with nine publications.

The three journals, namely, *Arts and Humanities in Higher Education*, *International Journal of Emerging Technologies in Learning*, and *Learning Media and Technology* contributed equally to producing eight articles. They garnered a combined total of forty-six citations for their work. The next two on the list had seven publications: *Computer Assisted Language Learning* and the *Journal of Adolescent and Adult Literacy*. According to the findings of the current bibliometric study, over 83% of the research that has been done in the field of digital storytelling has been conducted in the field of education or educational research. England was responsible for five journals, and the United States was responsible for two. Taiwan, Spain, and Germany each published one journal. That demonstrates that the research conducted in this field has a greater potential to be published in journals with a high impact factor. In addition, most of their indices are SSCI.

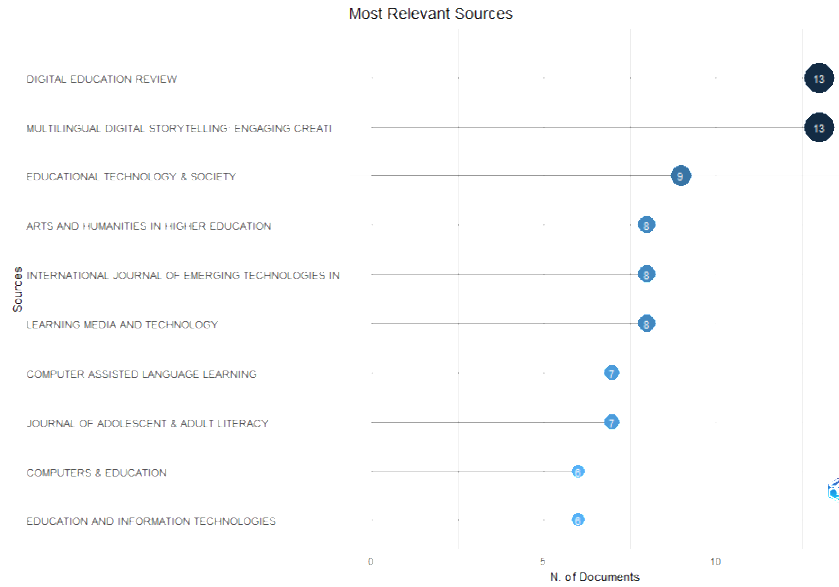


Figure 5. Most influential journals

Table 2. Most influential journals on digital storytelling in education

Rank	Journal	TC	IF	Q	Publisher	Country
1	Digital Education Review	340	1.8	Q2	Universitat de Barcelona	Spain
2	Multilingual Digital Storytelling	-	-	-	Taylor&Francis Online	UK
3	Educational Technology & Society	92679	3.5	Q1	National Taiwan Normal University	Taiwan
4	Arts And Humanities in Higher Education	5187	1.6	Q1	SAGE	UK
5	International Journal of Emerging Technologies in Learning	2916	2.5	Q2	Kassel University Press	Germany
6	Learning Media and Technology	21072	4.6	Q1	Routledge	UK
7	Computer Assisted Language Learning	-	4.7	Q1	Taylor and Francis Ltd	UK
8	Journal of Adolescent & Adult Literacy	348	1.1	Q2	Wiley-Blackwell	USA
9	Computers & Education	9202	11.1	Q1	Elsevier Ltd.	UK
10	Education and Information Technologies	3477	5.2	Q1	Kluwer Academic	USA

Keyword Analysis

Using the keyword analysis helped to discover a total of 416 keywords. In the abstract sections of the authors' articles, they offered up a total of 416 keywords for consideration. The keywords are displayed in Figure 6.



Figure 6. Keyword analysis word cloud

The most frequently used keywords were literacy (31), education (30), language (27), students (27), learning-motivation (25), pedagogy (20), English (19), stories (18), and knowledge. The most frequently used keywords were technology (42), literacy (31), and education (30). (15). The word "technology" is the one that sticks out the most whenever the green color is spoken in connection with anything at all. Some of the other terms that are associated with this keyword include "media literacies," "new literacies," "literacy," and "case study." The most important organizing element behind the keywords appears to be the concept of "literacy." The fact that the concept of "digital" is being brought to the forefront here illustrates the significance of "digital literacy" in this particular case. The word "education" is the one that stands out the most as a use of this particular keyword across this picture. Some of the different keywords related to it include "educational technology," "classroom," "interactive digital storytelling," "teaching," and "learning." Both concepts seem to coincide within the framework of the contributions that storytelling makes to both better engagement in educational settings and the use of multimedia

formats. The word "story" is the first one that springs to mind when I think of this. The most important idea connected with the red cluster seems to be summed up with the term "learning motivation." Other terms that are associated with it include "skills for the 21st century," "collaborative learning," "linguistic learning," "project-based learning," "engagement," and "web 2.0." That could be because digital storytelling is considered a motivational component of the learning process, as indicated by the clustering of the keyword "learning-motivation." This image contains several other keywords, some of which are "multimodality," "multiliteracies," "mobile learning," "blended learning," "participation," and "student involvement." It would appear that the element shared by the keywords that make up this cluster is the capability of digital stories to be applied in contexts that involve multiple types of media. Other terms that can be discovered in the figure are "design," "professional development," "creativity," and "technology-enhanced learning." The concepts discussed in this article shed light on the fact that the exploitation of digital storytelling is intricately connected with professional development and reflection.

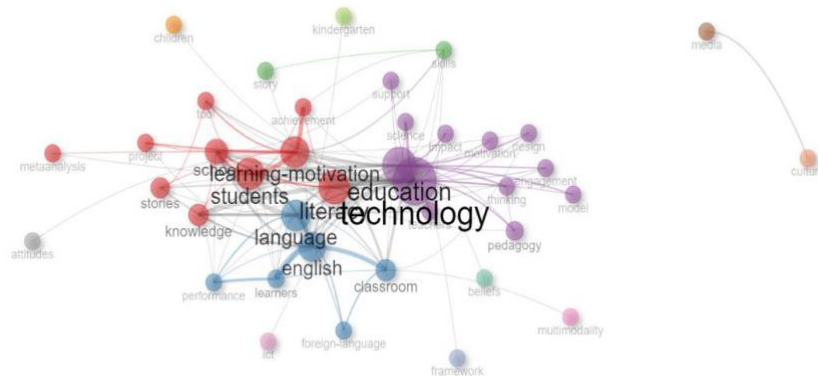


Figure 7. The most frequently used keywords

Major Themes in Digital Storytelling in Education

The sixteen different focuses of digital storytelling in education are presented in Figure 8. The total number of publications is organized into 16 categories. The second most common topic, literacy, comes in front with 42 publications, followed by technology. The years 2016–2021, which encompass a total of 73 articles, are the ones in which these two topics show the most significant progress in terms of time. Education is the theme that occurred as the third one in this graph for 30 publications.

However, the language theme only has 27 publications despite having the same number of publications as the theme language.

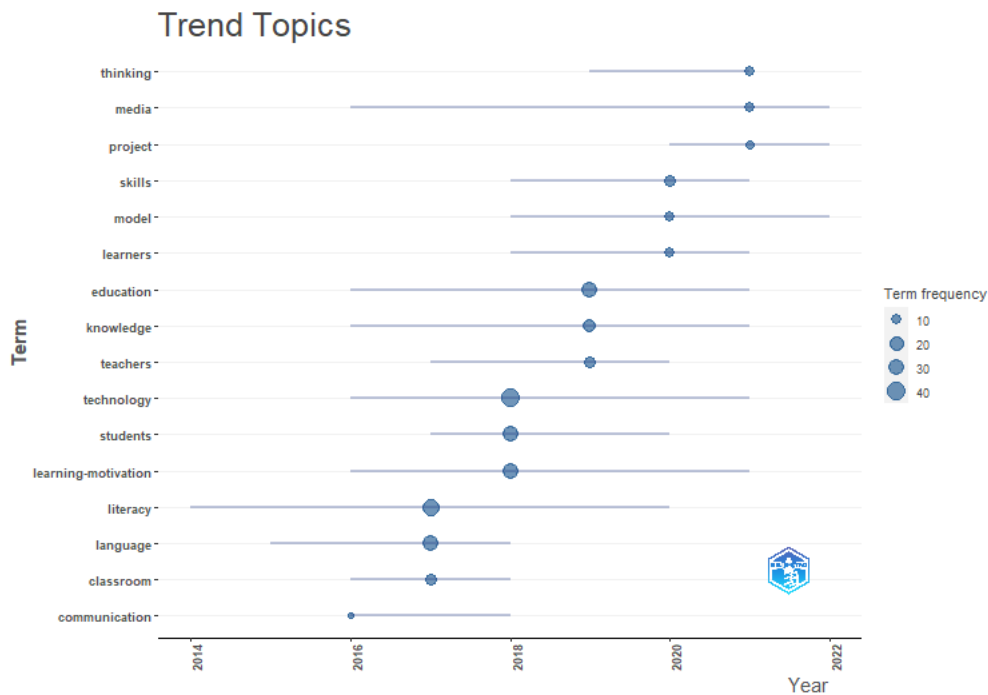


Figure 8. Different focuses of digital storytelling in education

Discussion and Conclusion

Bibliometric analysis examines patterns and trends in the literature associated with a specific subject area through quantitative data (Chang, et. al., 2015). In this investigation into the subject of digital storytelling, we utilized bibliometric methods in order to gather information. This study's objectives included determining the most influential authors, publications, and research topics on the subject, as well as investigating the field's expansion and development during its existence. The present study utilized the bibliometric approach to describe patterns and shifts in digital storytelling over the previous 20 years. The publications, sources of publications, authors, research institutions, and research topics were analyzed using citation information. In the realm of digital storytelling, we anticipated that the results of our bibliometric research would disclose numerous important conclusions. We set out to determine which writers and papers were the most important in the discipline and which journals were the most influential overall. In addition, we investigated the

subject's expansion and development throughout time, as well as the most significant research topics being pursued within it now.

Based on the findings of recently conducted research, it is possible to conclude that using digital storytelling as a teaching method is the most effective approach. In light of these findings, additional research could be conducted on using digital storytelling in English language teaching contexts and developing English language skills, as in all areas of education. Researchers should be encouraged to publish studies in journals listed within databases recognized by the scientific world as well-founded and authoritative resources of academic literature. In addition, the use of digital storytelling in English language teaching contexts and the development of English language skills could also be studied. Researchers interested in working on this topic in the English language education research area or any other field of education may find it helpful to examine the global trend of studies published on digital storytelling in education. It is because doing so is thought to provide a valuable guide for such researchers. As a result, there is room for expansion in the number of studies investigating these tendencies.

Moreover, it was discovered that the United States was the nation that provided the most significant contribution to the field of digital storytelling. It was discovered that Türkiye ranked second in the number of publications contributed to the field, while it ranked seventh in the number of citations. When Türkiye's role in the development of the trend in WoS is analyzed, it can be seen that out of Türkiye's 67 articles, the one with the highest number of citations ($N = 29$) was the article titled "The effect of digital storytelling on visual memory and writing skills," which was written by two researchers from Türkiye, Cral-Sarca and Kocak-Usluel (2016). When the general citation data of the 67 Turkish articles on digital storytelling in WoS were examined, it was found that 26 of the articles had at least one citation. In contrast, 17 of the articles had not yet been cited at all. The articles that had not yet been cited were those that had not been published. In this scenario, increasing the number of citations to works sourced from academics affiliated to Turkish universities is likely to increase Türkiye's authority in the field.

Ethics committee permission information

Ethical approval is not applicable, because this article does not contain any studies with human or animal subjects.

References

- Al Khateeb, A. A. (2019). Socially orientated digital storytelling among Saudi EFL learners: An analysis of its impact and content. *Interactive Technology and Smart Education, 16*(2), 130-142.
- Arroba, J., & Acosta, H. (2021). Authentic digital storytelling as alternative teaching strategy to develop speaking skills in EFL classes. *LEARN Journal: Language Education and Acquisition Research Network, 14*(1), 317-343.
- de Bellis, N. (2009). *Bibliometrics and citation analysis: From the science citation index to cybermetrics*. Lanham, MD: Scarecrow Press.
- Chang, Y. W., Huang, M. H., & Lin, C. W. (2015). Evolution of research subjects in library and information science based on keyword, bibliographical coupling, and co-citation analyses. *Scientometrics, 105*(3), 2071-2087.
- De Jager, A., Fogarty, A., Tewson, A., Lenette, C., & Boydell, K. M. (2017). Digital storytelling in research: A systematic review. *The Qualitative Report, 22*(10), 2548-2582.
- Ertan Özen, N. (2020). Dijital hikâye oluşturma'nın ortaokul 7. sınıf öğrencilerinin yaratıcı düşünme becerisine katkısı (Doktora tezi).
<https://tez.yok.gov.tr/UlusalTezMerkezi/>
- Kabaran, G. G., & Duman, B. (2021). The effect of digital storytelling method on learning and study strategies. *International Journal of Technology in Education, 4*(4), 681-694.
- Kasami, N. (2020). Individual versus collective digital storytelling in EFL education in terms of student perceptions. *CALL for widening participation: short papers from EUROCALL 2020*, 149.
- Lanszki, A., & Kunos, N. (2021). The use of digital storytelling to address school-related burnout among 10-11 grade students. *Journal of Educational Sciences, 22*, 3-17.
- Ozkaya, P. G. (2020). Dijital öykülerin Türkçe dil becerilerinin gelişimine etkisi: Bir meta analiz çalışması [The effect of digital stories on the development of the Turkish language skills: A meta-analysis study]. *Ana Dili Eğitimi Dergisi, 8*(4), 1386-1405. <https://doi.org/10.16916/aded.787093>
- Özen, N. E., & Duran, E. (2019). Digital storytelling in secondary school Turkish courses in Turkey. *International Journal of Education and Literacy Studies, 7*(4), 169-179.

- Papadaki, A., Karagianni, E., & Driga, A. M. (2023). The role of digital and traditional storytelling on teaching English to young learners-Detecting gender stereotypes in fairy tales. *TechHub Journal*, 6, 136-148.
- Pritchard, A. (1969). Statistical bibliography or bibliometrics? *Journal of Documentation*, 25, 348–349.
- Rance-Roney, J. (2008). Digital storytelling for language and culture learning. *Essential teacher*, 5(1), 29-31.
- Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory into practice*, 47(3), 220-228.
- Roemer, R. C., & R. Borchardt. (2015). *Meaningful metrics: A 21st century librarian's guide to bibliometrics, altmetrics, and research impact*. Chicago, IL: American Library Association.
- Sadik, A. (2008). Digital storytelling: A meaningful technology-integrated approach for engaged student learning. *Educational technology research and development*, 56(4), 487-506.
- Schmier, S. A. (2021). Using digital storytelling as a turn-around pedagogy. *Literacy*, 55(3), 172-180.
- Schmier, S. (2022). An inquiry into the possibilities of collaborative digital storytelling. *Contemporary Issues in Technology and Teacher Education*, 22(1), 5-25.
- Sembiring, D. L. B., & Simajuntak, D. C. (2023). Digital storytelling as an alternative teaching technique to develop vocabulary knowledge of EFL learners. *Journal of Languages and Language Teaching*, 11(2), 211-224.
- Somdee, M., & Suppasetsee, S. (2007). Developing English speaking skills of Thai undergraduate students by digital storytelling through websites. The Foreign Language Learning and Teaching International Conference, 1997, 166–176. <http://www.litu.tu.ac.th/journal/FLLTCP/Proceeding/16.6.pdf>
- Yang, Y. C., & Wu, W. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education*, 59(2), 339-352. <https://dx.doi.org/10.1016/j.compedu.2011.12.012>