

Bibliometric analysis of digital-based education services

Nuril Furkan¹, Sumarno², Ahmad Budidarma³

¹Universitas PGRI Palembang, Indonesia

^{2,3}Direktorat Guru Pendidikan Menengah dan Pendidikan Khusus Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, Indonesia

²Universitas Surakarta, Indonesia

Email: nurilfurkan.97@gmail.com

ABSTRACT

Finding the ideal solution is now largely hampered by the availability of digital-based education providers. This article uses the Vosviewer program is used to carry out the bibliometric process. Numerous papers from throughout the globe have made significant contributions to the discussion of this phenomenon. In the period of the COVID-19 pandemic, developed nations have done study on digitally based education services by offering findings that are able to accomplish maximum job productivity. The information was gathered from a variety of pertinent international journal references from several sources, including dimension.ai, publish, or peris, which served as the standard for locating pertinent references.

Keywords: education services; digital; technology Innovation

INTRODUCTION

The world is currently undergoing a massive transformation, specifically Industrial Revolution 4.0 (Jabbar et al., 2016; Mackenzie et al., 2021; Tay et al., 2022; Teräs et al., 2022). The Industrial Revolution 4.0 is a transformation in the mechanism for the production of goods and services characterized by the use of the Internet of Things (IoT), big data, automation, robotics, cloud computing, and artificial intelligence, among others. Government entities are also affected by this transformation. This results in increasingly difficult challenges for each location. Migration and population expansion cause economic, social, cultural, and security challenges. The community expects the local government to provide ideal public services, often known as superior service.

Experts around the world are conducting research on digital-based services in the education aspect (Benavides et al., 2020; Cao et al., 2022; Early & Hernandez, 2021; Edwards et al., 2020; Hoffmann et al., 2022; Orsolini et al., 2021). However, there are also problems with digital-based education services, especially in remote areas and do not have internet access (Abdallah Altarawneh & Awwad Alomoush, 2022; Cifuentes et al., 2022; Crook & Bligh, 2016; Komljenovic, 2022; Milutinović, 2022; Mohamed Hashim, Tlemsani, & Matthews, 2022). In contrast to areas close to urban access, which already have complete internet facilities. Therefore, experts want to find solutions to these problems, so that problems in remote areas can take advantage of internet facilities as much as possible.

METHOD

The Vosviewer program is used to carry out the bibliometric process. The authors employed a variety of methods to collect the data before assessing the data from the article and numerous references. The Scopus website, Publisher Taylor, France, Dimensions Index, and Publish or Peris are the first places to check for references. Additionally, the collected information is entered into the Vosviewer application to systematically and consistently map the study's focus. Searching for references that are current and relevant to the subjects being studied while using the keywords "Digital Education" OR "Education Service."

RESULT AND DISCUSSION

Result

In the era of technology 4.0, the optimal solution for resolving difficulties is digital education services. A subject that has been the focus of numerous investigations and researches. Diverse scientific ideas have contributed perspectives, and it is challenging to assess problems and provide solutions for each country. Figure 1 presents an analysis of research studies from various countries.

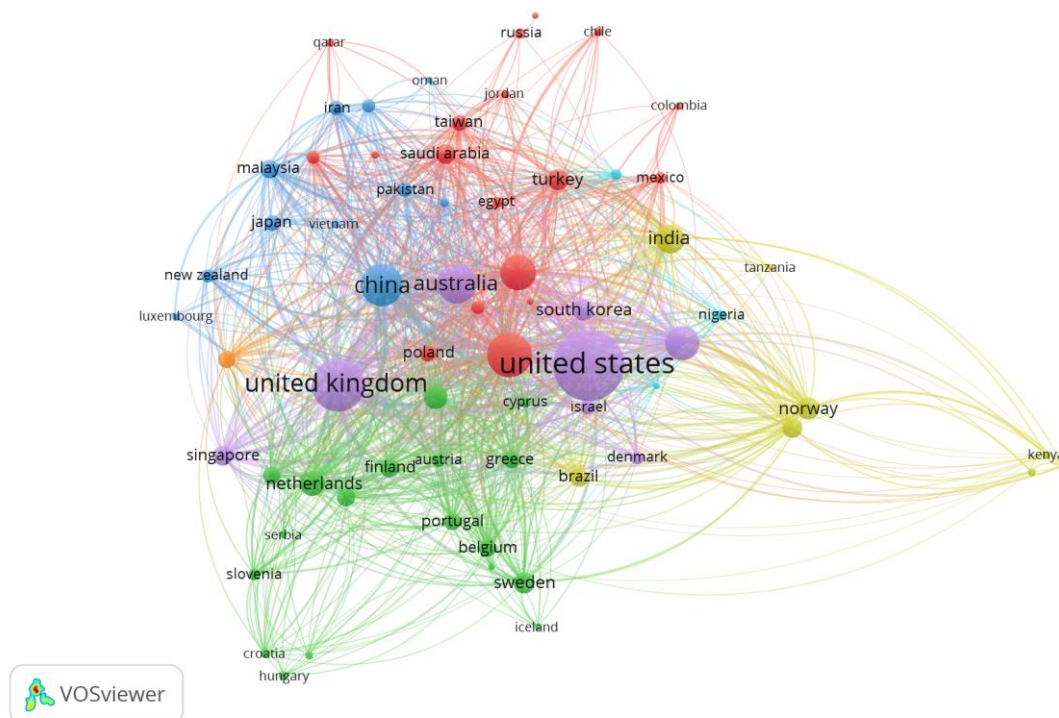


Figure 1. Digital-based Education Service Research Study of the number of documents and Citations.

Figure 1 presents research from various countries that have presented various researches that are expected to provide the right solution from each field of science. Countries that contributed the most were the United States, United Kingdom, China, and Australia. This is directly proportional to the number of citations with the number of documents produced. While the keywords that often appear from various article references obtained from various sources are presented in Figure 2.

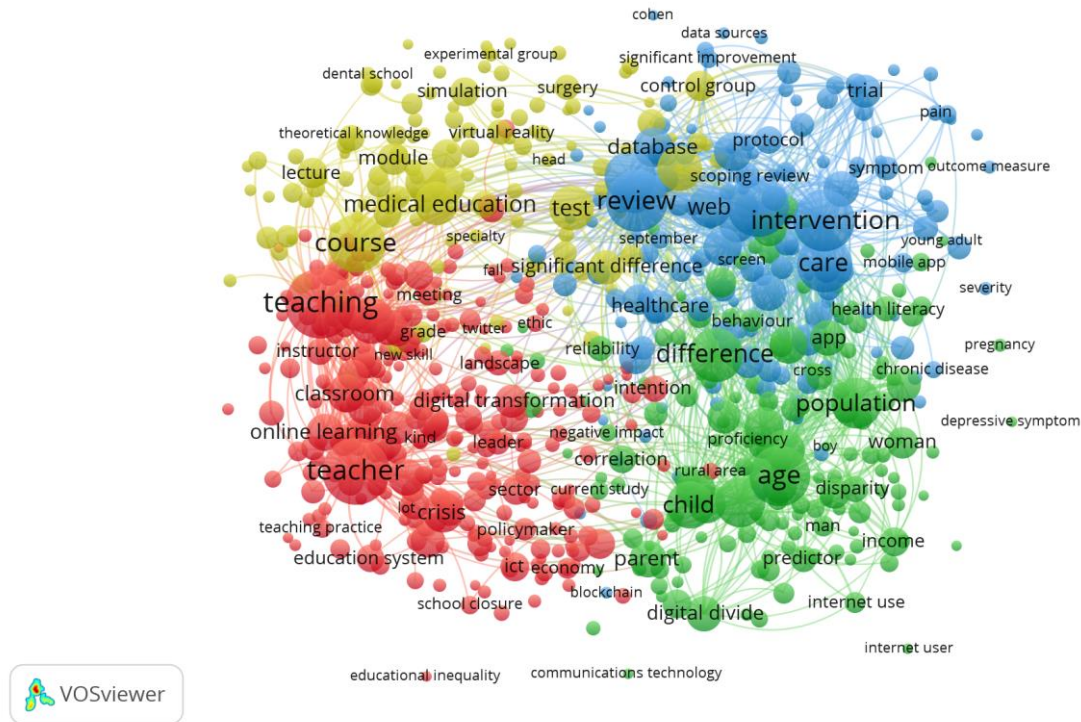


Figure 2. Article Keywords in Reference

Figure 2 presents research from various journals of international repute which are expected to provide solutions to any problems faced. Keywords that often appear are teaching, classroom, digital transformational, database, digital divide; applications, online learning, meetings, web, and many others.

Discussion

The number of researches on digital-based educational services has made a very significant contribution to scientific development. This can be seen from the literature review presented, seen from the number of articles from developed countries that have presented educational innovations in providing digital-based services. This is expected to be able to provide solutions for developing and underdeveloped countries to welcome the industrial era 4.0.

Based on the keywords obtained, it can be given an illustration that currently digital-based education has been used from various regions in the world. Especially during the COVID-19

pandemic, various online learning innovations have not been implemented optimally (Barnes, 2020; Kang, 2022; Long et al., 2021; Maravilla et al., 2022; Mohamed Hashim, Tlemsani, & Duncan Matthews, 2022; Renfrew et al., 2021; Vasile et al., 2021; Yang et al., 2022). During the COVID-19 pandemic, it turned out to be able to provide solutions for every international meeting that was often done offline, such as international conferences via offline, now it is done online. Every activity has been carried out online with no limits both far and near.

Various studies have been carried out by experts who reveal that digital education services help kayakers to carry out their daily activities. Just as students and lecturers can carry out lecture activities via online (Barnes, 2020; Fawns & Schaepekens, 2022; Garcez et al., 2022; Javaid et al., 2021; Kang, 2022; Long et al., 2021; Maravilla et al., 2022; Mohamed Hashim, Tlemsani, & Duncan Matthews, 2022; Petráková et al., 2020; Renfrew et al., 2021; Thakur et al., 2021; Vasile et al., 2021; Yang et al., 2022). Therefore, digital-based education services are certainly able to realize a better level of work efficiency than before.

CONCLUSION

Digital-based education services have become a central issue in finding the right solution. Various articles from around the world have contributed a lot in discussing this phenomenon. Developed countries have conducted research on digital-based education services in the era of the COVID-19 pandemic by providing results that are able to realize maximum work efficiency. The data was obtained from various relevant international journal references from various sources such as dimension.ai, publish or peris which became the reference in finding relevant references.

REFERENCES

- Abdallah Altarawneh, A. M., & Awwad Alomoush, R. A. (2022). The reality of E-counseling services in the light of Digital learning from the point of View of Teachers in Jordan. *Education and Information Technologies*, 1–20. <https://doi.org/10.1007/s10639-022-11102-8>
- Barnes, S. J. (2020). Information management research and practice in the post-COVID-19 world. *International Journal of Information Management*, 55, 102175. <https://doi.org/10.1016/j.ijinfomgt.2020.102175>
- Benavides, L. M. C., Arias, J. A. T., Serna, M. D. A., Bedoya, J. W. B., & Burgos, D. (2020). Digital Transformation in Higher Education Institutions: A Systematic Literature Review. *Sensors*, 20(11), 3291. <https://doi.org/10.3390/s20113291>
- Cao, L., Niu, H., & Wang, Y. (2022). Utility analysis of digital villages to empower balanced urban-rural development based on the three-stage DEA-Malmquist model. *PLoS ONE*, 17(8), e0270952. <https://doi.org/10.1371/journal.pone.0270952>
- Cifuentes, M. E., Artieta-Pinedo, I., Paz-Pascual, C., Bully-Garay, P., García-Alvarez, A., Estalella, I., Trincado, M. J., Cabeza, I., Gagnon, M. P., Fernández, A., Lozano, G., Villanueva, G., Sánchez, J., Maquibar, A., Moreno, D., Legarra, C., Mulas, M. J., Blas, M., Amorrortu, P., ... Pérez, C. (2022). EMAeHealth, a digital tool for the self-management of women's health needs during pregnancy, childbirth and the puerperium: protocol for a hybrid effectiveness-implementation study. *BMJ Open*, 12(9), e055031. <https://doi.org/10.1136/bmjopen-2021-055031>
- Crook, C., & Bligh, B. (2016). Technology and the dis-placing of learning in educational futures.

- Learning, Culture and Social Interaction*, 11, 162–175. <https://doi.org/https://doi.org/10.1016/j.lcsi.2016.09.001>
- Early, J., & Hernandez, A. (2021). Digital Disenfranchisement and COVID-19: Broadband Internet Access as a Social Determinant of Health. *Health Promotion Practice*, 22(5), 605–610. <https://doi.org/10.1177/15248399211014490>
- Edwards, S., Nolan, A., Henderson, M., Grieshaber, S., Highfield, K., Salamon, A., Skouteris, H., & Straker, L. (2020). Rationale, Design and Methods Protocol for Participatory Design of an Online Tool to Support Industry Service Provision Regarding Digital Technology Use ‘with, by and for’ Young Children. *International Journal of Environmental Research and Public Health*, 17(23), 8819. <https://doi.org/10.3390/ijerph17238819>
- Fawns, T., & Schaepkens, S. (2022). A Matter of Trust: Online Proctored Exams and the Integration of Technologies of Assessment in Medical Education. *Teaching and Learning in Medicine*, 34(4), 444–453. <https://doi.org/10.1080/10401334.2022.2048832>
- Garcez, A., Silva, R., & Franco, M. (2022). Digital transformation shaping structural pillars for academic entrepreneurship: A framework proposal and research agenda. *Education and Information Technologies*, 27(1), 1159–1182. <https://doi.org/10.1007/s10639-021-10638-5>
- Hoffmann, C., Kobetic, M., Alford, N., Blencowe, N., Ramirez, J., Macefield, R., Blazeby, J. M., Avery, K. N. L., & Potter, S. (2022). Shared Learning Utilizing Digital Methods in Surgery to Enhance Transparency in Surgical Innovation: Protocol for a Scoping Review. *JMIR Research Protocols*, 11(9), e37544. <https://doi.org/10.2196/37544>
- Jabbar, A., Gasser, R. B., & Lodge, J. (2016). Can New Digital Technologies Support Parasitology Teaching and Learning? *Trends in Parasitology*, 32(7), 522–530. <https://doi.org/https://doi.org/10.1016/j.pt.2016.04.004>
- Javaid, M., Haleem, A., Pratap Singh, R., & Suman, R. (2021). Pedagogy and innovative care tenets in COVID-19 Pandemic: An enhance way through Dentistry 4.0. *Sensors International*, 2, 100118. <https://doi.org/10.1016/j.sintl.2021.100118>
- Kang, B. (2022). *How the COVID-19 Pandemic Is Reshaping the Education Service* (hal. 15–36). https://doi.org/10.1007/978-981-33-4126-5_2
- Komljenovic, J. (2022). The future of value in digitalised higher education: why data privacy should not be our biggest concern. *Higher Education*, 83(1), 119–135. <https://doi.org/10.1007/s10734-020-00639-7>
- Long, Z., Zhao, G., Wang, J., Zhang, M., Zhou, S., Zhang, L., & Huang, Z. (2021). Research on the Drivers of Entrepreneurship Education Performance of Medical Students in the Digital Age. *Frontiers in Psychology*, 12, 733301. <https://doi.org/10.3389/fpsyg.2021.733301>
- Mackenzie, S. C., Cumming, K. M., Garrell, D., Brodie, D., Wilson, L., Mehar, S., Cunningham, S. G., Bickerton, A., & Wake, D. J. (2021). Massive open online course for type 2 diabetes self-management: adapting education in the COVID-19 era. *BMJ Innovations*, 7(1), 141–147. <https://doi.org/10.1136/bmjinnov-2020-000526>
- Maravilla, J., Catiwa, J., Guariño, R., Yap, J. F., Pagatpatan, C., Orolfo, D. D., de Silos, J., Leigh, M. C., Babate, J., & Lopez, V. (2022). Exploring indirect impacts of COVID-19 on local health systems from the perspectives of health workers and higher education stakeholders in the Philippines using a phenomenological approach. *The Lancet Regional Health - Western Pacific*, 100585. <https://doi.org/10.1016/j.lanwpc.2022.100585>
- Milutinović, V. (2022). Examining the influence of pre-service teachers’ digital native traits on their technology acceptance: A Serbian perspective. *Education and Information Technologies*, 27(5), 6483–6511. <https://doi.org/10.1007/s10639-022-10887-y>

- Mohamed Hashim, M. A., Tlemsani, I., & Duncan Matthews, R. (2022). A sustainable University: Digital Transformation and Beyond. *Education and Information Technologies*, 27(7), 8961–8996. <https://doi.org/10.1007/s10639-022-10968-y>
- Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. (2022). Higher education strategy in digital transformation. *Education and Information Technologies*, 27(3), 3171–3195. <https://doi.org/10.1007/s10639-021-10739-1>
- Orsolini, L., Jatchavala, C., Noor, I. M., Ransing, R., Satake, Y., Shoib, S., Shah, B., Ullah, I., & Volpe, U. (2021). Training and education in digital psychiatry: A perspective from Asia-Pacific region. *Asia-Pacific Psychiatry*, 13(4), e12501. <https://doi.org/10.1111/appy.12501>
- Petráková, A., Příkazský, V., Hlavinka, A., & Holý, O. (2020). Strengthening core competences and skills of medical and public health students for digital health. *European Journal of Public Health*, 30(Supplement_5), ckaa165.026. <https://doi.org/10.1093/eurpub/ckaa165.026>
- Renfrew, M. J., Bradshaw, G., Burnett, A., Byrom, A., Entwistle, F., King, K., Olayiwola, W., & Thomas, G. (2021). Sustaining quality education and practice learning in a pandemic and beyond: 'I have never learnt as much in my life, as quickly, ever.' *Midwifery*, 94, 102915. <https://doi.org/10.1016/j.midw.2020.102915>
- Tay, L.-Y., Tai, H.-T., & Tan, G.-S. (2022). Digital Financial Inclusion: A Gateway to Sustainable Development. *Heliyon*, 8(6), e09766. <https://doi.org/10.1016/j.heliyon.2022.e09766>
- Teräs, M., Suoranta, J., Teräs, H., & Curcher, M. (2022). Post-Covid-19 Education and Education Technology 'Solutionism': a Seller's Market. *Postdigital Science and Education*, 2(3), 863–878. <https://doi.org/10.1007/s42438-020-00164-x>
- Thakur, A., Soklaridis, S., Crawford, A., Mulsant, B., & Sockalingam, S. (2021). Using Rapid Design Thinking to Overcome COVID-19 Challenges in Medical Education. *Academic Medicine*, 96(1), 10.1097/acm.0000000000003718. <https://doi.org/10.1097/acm.0000000000003718>
- Vasile, V., Panait, M., & Apostu, S.-A. (2021). Financial Inclusion Paradigm Shift in the Postpandemic Period. Digital-Divide and Gender Gap. *International Journal of Environmental Research and Public Health*, 18(20), 10938. <https://doi.org/10.3390/ijerph182010938>
- Yang, L., Martínez-Abad, F., & García-Holgado, A. (2022). Exploring factors influencing pre-service and in-service teachers' perception of digital competencies in the Chinese region of Anhui. *Education and Information Technologies*, 1–26. <https://doi.org/10.1007/s10639-022-11085-6>