

SYSTEMATIC LITERATURE TRANSFORMATION OF DIGITAL-BASED EDUCATION GLOBALLY POST COVID-19 PANDEMIC

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Abstract

The vaccination process, which has been going on globally as a preventive solution in handling the COVID-19 outbreak, has provided a breath of fresh air for human survival, one of which is in the field of education, which for approximately two years has forced all schools to implement online learning, but in doing so, it has had an effect on the development of education in terms of digitalization. The purpose of this article is to conduct a systematic literature review of the transformation of education that is more directed towards the application of digitalization in educational institutions. The main contribution of this article is to systematically collect, analyze, and discuss knowledge disseminated in this field, support future research, and strengthen the literature related to the future direction of education, especially after the COVID-19 pandemic. The data search process in this article uses the Denyer and Tranfield model, which has 5 systematic steps. The important finding in this article is that education globally is transforming in terms of utilizing digital platforms to support the education process both during and after the COVID-19 pandemic.

Keywords: Education Transformation, Digital-based Learning, COVID-19.

مستخلص البحث

إن عملية التطعيم التي تجري على مستوى العالم كحل وقائي للتعامل مع جائحة COVID-19، قد أتاحت الفرصة لالتقاط الأنفاس في مجال التعليم الذي أجبر جميع المدارس على تطبيق التعليم عن بعد منذ عامين تقريباً، ولكن ذلك كان له تأثير على تطور التعليم من حيث الرقمنة. المهدف من هذا المقال هو إجراء مراجعة منهجية للأدبيات المتعلقة بالتحول في التعليم والموجهة بشكل أكبر نحو تطبيق الرقمنة في المؤسسات التعليمية. وتتمثل المساهمة الرئيسية لهذه المقالة في جمع وتحليل ومناقشة المعرفة المنشورة في هذا المجال بشكل منهجي، ودعم البحوث المستقبلية، وتعزيز الأدبيات المتعلقة بالتوجه المستقبلي للتعليم، خاصة بعد جائحة COVID-19. واستخدم عملية البحث عن البيانات في هذه المقالة نموذج دينير وترانفيلد الذي يتضمن 5 خطوات منهجية. والنتيجة المهمة في هذه المقالة هي أن التعليم على مستوى العالم يشهد تحولاً من حيث استخدام المنصات الرقمية لدعم العملية التعليمية أثناء جائحة COVID-19 وبعدها.

الكلمات المفتاحية: تحول التعليم والتعلم القائم على التكنولوجيا الرقمية و COVID-19.

INTRODUCTION

Corona viruses are a large group of viruses that cause mild to severe illnesses ranging from the common cold to Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS).¹ On December 31, 2019, 27 cases of pneumonia of unknown etiology were identified in Wuhan City, Hubei province in China.² According to reports, ophthalmologist Dr. Li Wenliang first recognized symptoms of severe acute respiratory syndrome coronavirus 2 (now known as Corona Virus Disease 2019 (COVID-19) in seven of his patients, while developing the disease himself and eventually passing away on February 7, 2020.³ The global spread of COVID-19 led the World Health Organization (WHO) to declare it a pandemic on March 11, 2020.⁴ The pandemic quickly overwhelmed health provision around the world, with hospital resources being stretched to manage the outbreak. Hospitals have adopted drastic changes to the structure of care, including the upgrading of general wards to intensive care units, the cancellation of elective surgeries and the redeployment of healthcare providers.⁵ In addition to the socio-economic impact of COVID-19 and the changes implemented in the healthcare delivery system, it has also affected all levels of the education system, from pre-school to tertiary education, mainly due to a decrease in the workforce in all academic sectors, as well as due to measures to prevent the spread of the virus.⁶ Social distancing is a key measure to slow the transmission of the virus. As a result, in many countries, the government decided to close schools and universities, thus shifting to online teaching or the so-called transformation from conventional learning to digital-based learning.⁷ Today, learning activities are encouraged to combine conventional learning methods and technology integration. The learning process is known as blended learning or digital learning.⁸

From the results of the research study above, it shows that with the COVID-19 pandemic outbreak, it brings dynamics to the face of world education for changes in the teaching and learning process which has been carried out conventionally in the classroom, then turning to virtual space

¹ Novianti Indah Putri et al., "Educational Technology and Digital Transformation during the COVID-19 Pandemic" 20 (2021): 5.

² Lu H, Stratton CW, Tang YW. Outbreak of pneumonia of unknown etiology in Wuhan, China: the mystery and the miracle. *J Med Virol.* 2020; 92: 401-2

³ Irini Chatziralli et al., "Transforming Ophthalmic Education into Virtual Learning during COVID-19 Pandemic: A Global Perspective," *Eye* 35, no. 5 (May 2021): 1459–66. <https://doi.org/10.1038/s41433-020-1080-0>

⁴ Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed.* 2020; 91:157-60.

⁵ Kogan M, Klein SE, Hannon CP, Nolte M. Orthopaedic education during the COVID-19 pandemic. *J Am Acad Orthop Surg.* 2020; 28: e 456-64.

⁶ Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus and COVID-19 pandemic: a review. *Int J Surg.* 2020; 78:185-93.

⁷ Chatziralli et al., "Transforming Ophthalmic Education into Virtual Learning during COVID-19 Pandemic".

⁸ Armaidly Armawi et al., "Digital Learning Transformation in Strengthening Self-Resilience," *Journal of Civics: Media for Civic Studies* 18, no. 1 (April 1, 2021): 10–25. <https://doi.org/10.21831/jc.v18i1.36250>

or digital learning. This is an indicator that the need for innovation and a clear concept in adapting learning in every situation, such as the COVID-19 outbreak, requires education to transform in terms of digitalization. As a reinforcement of this research, the research question is what the current world education transformation picture looks like in terms of utilizing digitalization. With this research question, this study aims to show a theoretical picture of the transformation of digital-based education globally post COVID-19 pandemic from the last two decades of years and review the areas that have been studied and researched to provide an overview of the potential for further research.

METHOD

To review theories that also lead to the identification of potential future research on educational transformation and digitalization post COVID-19 pandemic, the stages of preparing theoretical studies based on the systematic review method were carried out. This method is carried out in accordance with applicable procedures to provide utilization in future research. The stages of the systematic review carried out are the model developed by Denyer and Tranfield which has 5 stages, namely:⁹

- Formulation of research questions,
- Determination of research location,
- Selection and evaluation of research found,
- Analysis and synthesis,
- Reporting and further research utilization.

Referring to the method, this research began by determining the research question as the first step. The research question underlying this study is what the current world education transformation looks like in terms of the utilization of digitalization. The next step was to determine the research location. In this case, the keyword used in the database search was "Digital Education Transformation" with the 2019-2021 filter feature enabled to limit the search results. It was not combined with other related keywords. The databases used were extracted from reputed journal indexing platforms such as MDPI, Springer, ScienceDirect, Frontiers in Psychology, and Advanced Education. Due to the research and development goals of today's world, only articles from international databases were predominantly used in this study. Based on the search results there

⁹ K. Murata, K. Wakabayashi, and A. Watanabe, "Study on and instrument to assess knowledge supply chain systems using advanced kaizen activities in SMEs," Supply Chain Forum, vol. 15, no. 2, pp. 20-32, 2014.

were 21 articles then after the selection process there were 9 articles that were considered relevant to this study. The articles were then analyzed for interpretation, then made conclusions.

RESULTS AND DISCUSSION

The results of the article search based on the method used produced the information presented in the following table:

Article		
Reference	Method	Core Information
Siti et al, 2020. ¹⁰	Quantitative using a questionnaire as an instrument	The results of this study show that e-learning platform is the highest demand that students prefer compared to other learning platforms and tools. Hence, the implications of this study can be useful as a guideline to assist Malaysian Polytechnic lecturers in strengthening the practice of using digital learning and developing digital proficiency to enable education 4.0 in the future.
Armaidy et al, 2021. ¹¹	Qualitative with descriptive analysis	The impact of this digital learning system on students' independence is considerable. Support from family and school must be given fully to strengthen students' independence.
Yogesh et al, 2020. ¹²	Qualitative, with descriptive analysis	The obstruction of the implementation of the teaching and learning process caused by the COVID-19 pandemic, the digitization process provides space and a positive impact on the continuity of the education process.
Putri et al, 2021. ¹³	Qualitative, with descriptive analysis	If all education is ready to implement changes, especially in digital transformation, it will produce students and graduates who have the readiness to face a world full of digitalization for future progress.
Víctor J. et al, 2021. ¹⁴	Survey, with review analysis	The availability of digital technologies supporting online learning presents an unprecedented opportunity for higher transformation of education at a global level. We are all involved in the digital world, and the phenomenon of online learning is here to stay. After a few months of online experience, a paradigm

¹⁰ Siti Dianah Abdul Bujang et al, "Digital Learning Demand for Future Education 4.0-Case Studies at Malaysian Education Institutions," *Informatics*7, no.2(30April2020):13. <https://doi.org/10.3390/informatics7020013>.

¹¹ Armawi et al, "Digital Learning Transformation in Strengthening Self-Resilience."

¹² Yogesh K. Dwivedi et al, "Impact of COVID-19 Pandemic on Information Management Research and Practice: Transforming Education, Work and Life," *International Journal of Information Management* 55 (December 2020): 102211. <https://doi.org/10.1016/j.ijinfomgt.2020.102211>.

¹³ Putri et al., "Educational Technology and Digital Transformation during the COVID-19 Pandemic".

¹⁴ Víctor J. García-Morales, Aurora Garrido-Moreno, and Rodrigo Martín-Rojas, "The Transformation of Higher Education After the COVID Disruption: Emerging Challenges in an Online Learning Scenario", *Frontiers in Psychology* 12 (February 11, 2021): 616059. <https://doi.org/10.3389/fpsyg.2021.616059>.

		shift has taken place in university education. Online teaching has gained relevance and ensured its survival even after the COVID-19 pandemic. Our examination revealed the use of a plethora of technological tools and platforms to support online learning: web-based learning platforms, video conferencing tools, Massive Open Online Courses (MOOCs), streaming conferences, instant messaging tools, and educational apps, among others, to support new methodologies to enable the learning process.
Chatziralli et al, 2021. ¹⁵	Survey	A total of 321 participants from academic and non-academic institutions around the world, with variable practice experience and expertise, completed the survey. Before the pandemic, the majority of participants used traditional training modalities, including lectures, large rounds and journal clubs, and 48% did not use e-learning. There was a statistically significant increase in the use of all e-learning alternatives during the pandemic ($p < 0.001$), mainly related to the availability of e-learning facilities ($p < 0.001$) and the academic character of the institution ($p < 0.001$). Zoom was recognized as the most widely used platform for virtual teaching. Although theoretical teaching was feasible, resident/same-sex surgical training was drastically reduced. The latter was significantly related to participants' perspectives on teaching practice ($p < 0.001$).
Mohamed Ashmel et al, 2022. ¹⁶	Qualitative with descriptive analysis	Digital transformation as a driving force can be used to build competitive advantage for universities. Building competitive advantage is a relative, evolving, and important concept in formulating strategy. In recent years, especially in the education industry, the idea of building competitive advantage is challenged by global phenomena such as digital transformation globalization, information exchange, digitalization and social media in most global industries. These phenomena collectively make the process of building competitive advantage change rapidly, short-term and contextualized. This research provides direct insights into the impactful changes affecting universities' visions and how they can turn these changes to their advantage and establishes a roadmap for designing-developing models to integrate and orchestrate these important changes in their strategies using evolutionary learning mechanisms and digital transformation strategies.

¹⁵ Chatziralli et al., "Transforming Ophthalmic Education into Virtual Learning during COVID-19 Pandemic".

¹⁶ Mohamed Ashmel Mohamed Hashim, Issam Tlemsani, and Robin Matthews, "Higher Education Strategy in Digital Transformation," *Education and Information Technologies* 27, no. 3 (April 2022): 3171–95. <https://doi.org/10.1007/s10639-021-10739-1>.

Mutasem et al, 2021. ¹⁷	Survey	This study reviews the most commonly used technologies in the delivery of learning materials, with the most infected country experiences under consideration. The main challenges in online learning are also discussed in this study. Furthermore, Saudi Arabia was considered as a case study for the effectiveness of distance learning during the spring semester of 2020, where 300 undergraduate students were surveyed about their opinions on distance learning. Responses to the survey indicated that distance learning is effective in providing students with the necessary knowledge during the outbreak of COVID-19. Findings show that although lack of interaction and poor internet connection linkages are factors that affect the comfort and success of learning physics and math, 63% of students are satisfied with the learning management system, 75% of students find it easy to understand the subject matter, and 67% of students find it easy to understand assignments and can handle them comfortably. Learning Such findings may encourage educational institutions to digitize their learning materials in the future.
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From a total of 9 articles from the table above, there is no method that dominates the selection results of article and book chapter searches. There are 4 articles that use qualitative methods, namely Armaidy, Yogesh, Putri, and Mohamed, 3 articles of which use survey methods, namely Victor, Chatziralli, Mutasem only 1 article that uses quantitative methods, namely Siti. Regarding the object of research, the 9 articles above discuss the transformation of digitalization that supports the sustainability of education in the era of the Covid 19 pandemic. The articles above reveal that the role of digitalization, namely by utilizing the role of technology, has a positive impact on learning and other educational instruments such as administration, management and so on. Regarding the potential for future research, this study aims to provide an overview and also a discourse on the process of digitalization as a supporting force that provides a thousand positive impacts on the implementation of education today and also education in the future.

CONCLUSION

With the outbreak of the COVID-19 pandemic, digital transformation that integrates in education began to be implemented and developed. The digitization process has more or less given a new style to the implementation of education during the COVID-19 pandemic, such as in the

¹⁷ Mutasem K. Alsmadi et al., "Digitalization of Learning in Saudi Arabia during the COVID-19 Outbreak: A Survey," *Informatics in Medicine Unlocked* 25 (2021): 100632. <https://doi.org/10.1016/j.imu.2021.100632>.

learning process which is carried out virtually with the help of technology and also social media platforms. That way global education must then be able to respond to the changes of the times, one of which is digital transformation that can be adapted and implemented towards the development and progress of education.

REFERENCE

- Alsmadi, Mutasem K., Ibrahim Al-Marashdeh, Malek Alzaqebah, Ghaith Jaradat, Fahad A. Alghamdi, Rami Mustafa A Mohammad, Muneerah Alshabanah, dkk. "Digitalization of Learning in Saudi Arabia during the COVID-19 Outbreak: A Survey". *Informatics in Medicine Unlocked* 25 (2021): 100632. <https://doi.org/10.1016/j.imu.2021.100632>.
- Armawi, Armaid, Chesa Syaqlira Makmur, Murni Septiyanti, dan Darto Wahidin. "Digital Learning Transformation in Strengthening Self-Resilience". *Jurnal Civics: Media Kajian Kewarganegaraan* 18, no. 1 (1 April 2021): 10–25. <https://doi.org/10.21831/jc.v18i1.36250>.
- Bujang, Siti Dianah Abdul, Ali Selamat, Ondrej Krejcar, Petra Maresova, dan Ngoc Thanh Nguyen. "Digital Learning Demand for Future Education 4.0—Case Studies at Malaysia Education Institutions". *Informatics* 7, no. 2 (30 April 2020): 13. <https://doi.org/10.3390/informatics7020013>.
- Chatziralli, Irini, Camila V. Ventura, Sara Touhami, Rhianon Reynolds, Marco Nassisi, Tamir Weinberg, Kaivon Pakzad-Vaezi, dkk. "Transforming Ophthalmic Education into Virtual Learning during COVID-19 Pandemic: A Global Perspective". *Eye* 35, no. 5 (Mei 2021): 1459–66. <https://doi.org/10.1038/s41433-020-1080-0>.
- Dwivedi, Yogesh K., D. Laurie Hughes, Crispin Coombs, Ioanna Constantiou, Yanqing Duan, John S. Edwards, Babita Gupta, dkk. "Impact of COVID-19 Pandemic on Information Management Research and Practice: Transforming Education, Work and Life". *International Journal of Information Management* 55 (Desember 2020): 102211. <https://doi.org/10.1016/j.ijinfomgt.2020.102211>.
- García-Morales, Víctor J., Aurora Garrido-Moreno, dan Rodrigo Martín-Rojas. "The Transformation of Higher Education After the COVID Disruption: Emerging Challenges in an Online Learning Scenario". *Frontiers in Psychology* 12 (11 Februari 2021): 616059. <https://doi.org/10.3389/fpsyg.2021.616059>.
- Mohamed Hashim, Mohamed Ashmel, Issam Tlemsani, dan Robin Matthews. "Higher Education Strategy in Digital Transformation". *Education and Information Technologies* 27, no. 3 (April 2022): 3171–95. <https://doi.org/10.1007/s10639-021-10739-1>.
- Putri, Novianti Indah, Yudi Herdiana, Zen Munawar, dan Rita Komalasari. "Teknologi Pendidikan dan Transformasi Digital di Masa Pandemi COVID-19" 20 (2021): 5.
- K. Murata, dkk. "Study on and instrument to assess knowledge supply chain systems using advanced kaizen activity in SMEs", *Supply Chain Forum*, vol. 15, no. 2, pp. 20–32, 2014.
- Lu H, dkk. Outbreak of pneumonia of unknown etiology in Wuhan, China: the mystery and the miracle. *J Med Virol*. 2020; 92: 401–2.

- D Cucinotta , M Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed.* 2020; 91: 157–60.
- Kogan M, dkk. Orthopaedic education during the COVID-19 pandemic. *J Am Acad Orthop Surg.* 2020;28: e456–64.
- Nicola M, dkk. The socio-economic implications of the coronavirus and COVID-19 pandemic: a review. *Int J Surg.* 2020; 78:185–93.