Research Article:

Education Technology Research Trends in Indonesia During the COVID-19 Pandemic

Awal Kurnia Putra Nasution

Department of Tarbiyah, Institut Agama Islam Negeri Takengon, Jl. Aman Dimot No.10, Takengon, Lut Tawar, Aceh Tengah, Aceh 24519, Indonesia

E-mail: awalkpn@gmail.com

ABSTRACT

This study aims to determine trends in research on educational technology carried out during the COVID-19 pandemic in Indonesia. The research method used is a descriptive approach using content analysis. The results revealed four prominent trends, namely: (1) The most researched area during the COVID-19 pandemic were online learning; (2) The most used research method is library research; (3) The most widely used learning media are google classroom and WhatsApp; and (4) The trend of combining more than one learning media in online learning. From the trends found, it can be seen that Indonesia has developed in educational technology. It needs research on a larger scale covering the Asia-Pacific region in the future.

Keyword: research trends, educational technology, COVID-19 pandemic

INTRODUCTION

The development of educational technology today is very rapid; almost all fields of education currently use technology in practice. Initially, educational technology was only in the form of learning aids; now, learning has even used mobile technologies to social networks in its use (Huang et al., 2019). Educational technology facilitates learning and improves the quality of learning by utilising technology (Januszewski & Molenda, 2013). Online learning as a form of development of educational technology has become a social process of education in distance learning that can be a compliment or substitute for face-to-face learning (Hiltz & Turoff, 2005). The COVID-19 pandemic has forced drastic changes in education globally; knowledge that is usually carried out face-to-face has turned into learning that is carried out online without face-to-face. (Dhawan, 2020). This change in learning methods is carried out to prevent the transmission of the COVID-19 virus in schools due to interactions between students and students and between students and teachers. Current conditions require the use of educational technology to keep the learning going during the COVID-19 pandemic.

Research trends in educational technology show remarkable developments; this is in line with the increasing development of information technology which in practice is also applied in the field of education. Trends are changes or trends that occur in a particular system; trends can only bring a good or bad change, schools cannot control trends, but the best thing that can be done is to take advantage of trends in education (Natividad et al., 2018). Research in educational technology in Turkey shows that distance education and multimedia learning is a research subject that is becoming a trend (Kucuk et al., 2013). Educational technology trends in 2002–2014 show that learning approaches, quantitative and qualitative methods, and the use of questionnaires, interviews and documentation as data collection tools (Baydas et al., 2015). Research trends in the education sector in 2009–2018 on e-learning show that students, online teachers, and interactive learning environments are becoming favoured by researchers (Valverde-Berrocoso et al., 2020). Research conducted by Mishra shows a trend in the use of online distance learning during the COVID-19 pandemic, research that focuses on online distance learning, research methods using qualitative research methods, quantitative methods, and mixed methods. (Mishra et al., 2021). In 2020, trends in educational technology showed the use of social media, Facebook, Twitter in online learning (Kimmons et al., 2021). During the COVID-19 pandemic, there has been an explosion in the use of educational technology, which has shifted traditional learning to learning that applies information technology (Nguyen & Chung, 2020). Some of the trends above provide an overview of research trends in educational technology in recent years and during the COVID-19 pandemic.

Several studies related to educational technology trends in the Asia-Pacific region have been published; research conducted by Jung in 2000–2013 showed the introduction of digital technology on and off-campus (Jung & Yoo, 2014). One of the trends in the Asian region in 2001–2010 was the use of educational computer games and web 2.0-based learning (Hwang & Wu, 2012). These studies have been carried out for a long time,

and there is a need for research updates related to educational technology in the Asia-Pacific region, especially in Indonesia. This is to provide new and up-to-date insights regarding the trends in educational technology in Indonesia. The current extraordinary conditions throughout the world, especially in Indonesia with the COVID-19 pandemic, will undoubtedly have a tremendous impact on education, especially in educational technology. This study will reveal trends in educational technology research, such as what happened during the COVID-19 pandemic in Indonesia.

LITERATURE REVIEW

Technology plays a significant role in education development and is today more critical than ever. The rapid growth of educational use of mobile technology such as distance learning, simulations, immersive gaming, and virtual worlds has also drawn the attention of educational technology researchers. The Educational Communications and Technology Association (AECT) defines educational technology as "the research and ethical practice of promoting learning and improving performance through the development, use and management of acceptable technical processes and resources" (Januszewski & Molenda, 2013). Over the past century, educational technology has developed and changed considerably, influenced by numerous factors, including historical forces, paradigm shifts in educational psychology, new technologies and evolving inquiry approaches. Aside from advances and improvements, different research methods are frequently used (Anglin, 1995). Practitioners of educational technology and academics study various subjects and methodologies. Researchers in educational technology have traced patterns in the papers, theses and dissertations of the field beforehand. Some of the world's researchers have reviewed articles written in international newspapers (Hrastinski & Keller, 2007; Khe et al., 2007; Ross et al., 2020). However, in the scholarly literature, only a tiny amount of coverage has been given to papers in the journal in educational technology published by writers from Turkey. Fortunately, such studies have increased (Bozkaya et al., 2012; Gülbahar & Alper, 2009; Keser & Özcan, 2011). Some scholars have also reviewed educational technology theses or dissertations (Caffarella, 1999; Erdogmus, 2009; Şimşek et al., 2009). Usually, the researchers decide the subjects they will be concentrating on, the research methodologies that are ideally suited to their subject, and how to gather data.

METHODOLOGY

This research uses a descriptive approach to using content analysis. Descriptive methods can be used in descriptive phenomenology, content analysis, and thematic analysis (Vaismoradi et al., 2013). Content analysis is a research technique for making imitable and valid conclusions from a text (or other meaningful things) (Krippendor, 2004). Content analysis is a summary, quantitative analysis of messages that depends on scientific methods and is not limited to the type of variable that can be measured

or the context in which the message was created or presented (Neuendorf, 2001). This research was conducted by analysing content in words contained in scientific articles in Indonesian national journals. The keywords used in the search for scientific papers are 'educational technology', 'COVID', and 'corona'. Inclusion and exclusion criteria were applied in selecting the articles to be analysed. The inclusion criteria used are educational technology discussed during the COVID-19 pandemic and the research was conducted in the territory of Indonesia. Exclusion criteria used are articles that do not focus on the use of educational technology and book chapters. The items that are used as data sources are 41 scientific articles from 31 national journals. Searching for scientific articles is done with the help of Publish or Perish version 7 software. Publish or Perish 7 is a software that can be used to retrieve and analyse academic citations from various data sources (Harzing, 2020). Data search for scientific articles was carried out on 1 July 2020. To help analyse the composition, Nvivo 12 software is used. Coding can be done to assist content analysis in Nvivo 12 (Woolf & Silver, 2017). Table 1 shows a list of the journal articles that have been analysed.

Table 1. List of scientific journal and publisher

No.	Journal name	Publisher
1	ADI Bisnis Digital Interdisiplin Jurnal	ADI Publisher
2	Al Irsyad: Jurnal Bimbingan Konseling Islam	Imam Bonjol Padang University
3	Al Jahiz: Journal of Biology Education Research	IAIN Metro
4	Cetta: Jurnal Ilmu Pendidikan	Jayapangus Press
5	EduPsyCouns: Journal of Education, Psychology and Counseling	Muhammadiyah Enrekang University
6	EduTeach: Jurnal Edukasi dan Teknologi Pembelajaran	Muhammadiyah Riau University
7	Equilibrium: Jurnal Pendidikan	Muhammadiyah Makassar University
8	GERAM (Gerakan Aktif Menulis)	Islamic University of Riau
9	Ideguru: Jurnal Karya Ilmiah Guru	Dinas Pendidikan, Pemuda dan Olahraga DIY
10	Indonesian Journal of Educational Science (IJES)	West Sulawesi University
11	Indonesian Journal of STEM Education (IJSE)	Mataram University
12	JISAMAR (Journal of Information System, Applied, Management, Accounting and Research)	Jayakarta College of Informatics and Computer Management
13	Journal of Talent Development and Excellence	JTDE Press
14	Jurnal Edutic	Trunojoyo University Madura
15	Jurnal Ilmiah Profesi Pendidikan	Mataram University
16	Jurnal Ilmu Pendidikan dan Ekonomi	University of Jember

Table 1. (*Continued*)

No.	Journal name	Publisher
17	Jurnal Iqra': Kajian Ilmu Pendidikan	Ma'arif Institute of Islamic Religion NU
18	Jurnal MUDARRISUNA: Media Kajian Pendidikan Agama Islam	Ar-Raniry State Islamic University Banda Aceh
19	Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini	Pahlawan Tuanku Tambusai University
20	Jurnal Pendidikan dan Pengajaran	Ganesha University of Education
21	Jurnal Pendidikan Islam	State Islamic University (UIN) Sunan Kalijaga Yogyakarta
22	Jurnal Tawadhu	Imam Ghozali Institute of Islamic Religion
23	Jurnal Teknologi dan Manajemen Informatika	University of Merdeka Malang
24	JurTI (Jurnal Teknologi Informasi)	Asahan University
25	Karst: Jurnal Pendidikan Fisika dan Terapannya	Maros Muslim University
26	KINDERGARTEN: Journal of Islamic Early Childhood Education	State Islamic University (UIN) Suska Riau
27	LINEAR: Journal of Mathematics Education	State Institute of Islam Metro
28	Pandawa: Jurnal Pendidikan dan Dakwah	STIT Palapa Nusantara
29	Pepatudzu: Media Pendidikan dan Sosial Kemasyarakatan	Al Asyariah University Mandar
30	Perspektif Ilmu Pendidikan	State University of Jakarta
31	SALAM: Jurnal Sosial dan Budaya Syar-i	UIN Syarif Hidayatullah Jakarta

RESULTS

Subject Trends

The content analysis indicated that 25 articles (61%) discussed the subject of online learning, three articles (7.3%) on the use of information technology, and two articles (4.9%) are about online gamification. The use of game technology is one form of technological development in education, so it has become a good trend applied in learning (Osipovskaya & Miakotnikova, 2020). Two articles (4.9%) were about the Moodle application in learning. The use of Moodle in education provides a flexible e-learning learning experience, so communication between teachers and students can be done at any time, and this is a trend in learning using technology (Al-Ajlan & Zedan, 2008). Two articles (4.9%) were about the Google Classroom application in learning, two articles (4.9%) were about social media in education, two articles (4.9%) were about e-learning, one article (2.4%) were about a digital platform in learning, one report (2.4%) were about Youtube in education, and one article (2.4%) were about the Zoom application. For more details, see Table 2.

Table 2. Research subject trends

No.	Research subject trends	Total	Percentage
1	Online learning	25	61.0
2	Information technology	3	7.3
3	Online gamification	2	4.9
4	Moodle application	2	4.9
5	Google Classroom application	2	4.9
6	Social media	2	4.9
7	E-learning	2	4.9
8	Digital platform	1	2.4
9	Youtube	1	2.4
10	Zoom application	1	2.4
	Total	41	100

Trends in Research Methods

Research methods that were commonly used during the COVID-19 pandemic are reported in Table 3. Literature research is the most popular choice in research in the field of educational technology, with as many as 14 studies (34.1%). This is followed by qualitative research (as many as 11 studies or 26.8%), quantitative research (as many as nine research or 22.0%), research and development (R&D) research (as many as five research or 12.2%), and school action research (as many as two research or 4.9%).

Table 3. Trends in research methods

| No.	Research method trends	Total	Percentage
1	Library research	14	34.1
2	Qualitative research	11	26.8
3	Quantitative research	9	22.0
4	Research and development (R&D)	5	12.2
5	School action research	2	4.9
	Total	41	100

Learning Media Trends

Of all the articles analysed, not all discussed in detail what learning media were used and researched; only 24 articles included learning media. As shown in Table 4, e-learning and Google Classroom is the most widely used learning media, which is three times, then followed by the use of Moodle and gamification two times each, while the remaining media were reported once. The use of e-learning is now becoming a trend in education, with one of the strengths of learning using e-learning is collaborative learning (Martínez & Duart, 2016).

Table 4. Learning media trends

No.	Learning media	Frequency
1	E-learning	3
2	E-learning, Google Classroom, WhatsApp, Zoom	1
3	E-learning, social media	1
4	Gamification	2
5	Google Classroom	3
6	Google Classroom, Edmodo	1
7	Google Classroom, Edmodo, Zoom, Schoology	1
8	Google Classroom, Google Form, Quizizz	1
9	Messenger	1
10	Social media	1
11	Moodle	2
12	Smartphone	1
13	WhatsApp	1
14	WhatsApp, Edmodo	1
15	WhatsApp, Google Classroom	1
16	WhatsApp, Zoom, email	1
17	Youtube	1
18	Zoom	1

Another interesting fact recorded by the research was that there is a trend to use more than one learning medium. As many as four studies or 22% reported the phenomenon of using a combination of two learning media, two studies or 11% reported the practice of using up to three learning media, and two studies or 11% reported the practice of using four combined learning media at once (refer to Figure 1). Merging several learning media in teaching and learning is also called blended learning (Oliver & Trigwell, 2005). Blended learning itself has become a trend in higher education to provide solutions for learning that is enhanced with various technological innovations (Castro, 2019).
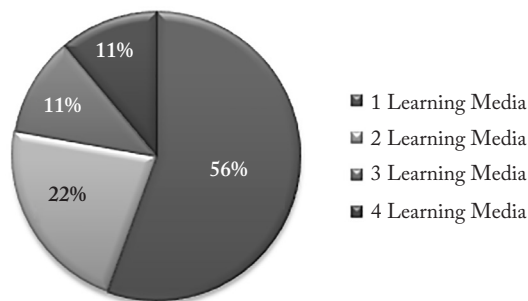
Figure 1. The trend of merging media combination

DISCUSSION

Based on the data, we can see that all learning conducted during the COVID-19 pandemic in Indonesia used the internet to implement the learning process. The most popular subject trend in online learning. It is in line with research conducted by Chick, who recommends innovative solutions in the use of technology in learning so that education continues to run well (Chick et al., 2020). Virtual platform learning becomes a significant potential in learning in the COVID-19 pandemic (Almarzooq et al., 2020). The choice of education that utilises technology and the internet, in particular, is an answer to the rules of learning from home in Indonesia.

The above data show that library research methods are a favourite choice of researchers; this could be due to implementing social distancing in Indonesia. The research conducted considers social distancing policy. The COVID-19 pandemic has caused the entire world, including Indonesia, to show social distancing to reduce the risk of global spread and disasters (Mona, 2020). Social distancing is one of the policies implemented in the face of a COVID-19 pandemic (Wilder-Smith & Freedman, 2020). Social distancing is also carried out in the education sector in China and Hong Kong to keep the spread of COVID-19 by temporarily closing schools (Viner et al., 2020). So, for this reason, library research is the most realistic choice for the current situation due to the COVID-19 pandemic.

E-learning itself in 2010 will be a trend in education, taking into account various strengths (Kumaran & Nair, 2010). Trends in educational technology show mobile applications, one of which is the choice of learning media is Google Classroom (Vijayakumar & RameshBabu, 2016). Google Classroom is a technological transformation in education that is done without meetings between teachers and students and remotely (Logofătu et al., 2015); therefore, the use of Google Classroom is very appropriate when learning from home. Google Classroom is the preferred learning medium due to the effectiveness of education and communication, so that it gives rise to interaction (Shaharanee et al., 2016). Learning using Google Classroom increases significantly compared to traditional learning (Ramadhani et al., 2019).

From the data, we can see that the most widely used learning media is Google Classroom eight times, followed by WhatsApp application five times, e-learning and zooming four times each, Edmodo three times. Gamification, social media, and Moodle were used two times, while the rest were only used once. From this data, we found that the most commonly used learning media are Google Classroom and WhatsApp. It proves that both learning media have become a trend in the COVID-19 pandemic periods in Indonesia. WhatsApp has become a trend in learning, especially in learning that involves parental participation (Addi-Raccah & Yemini, 2018). It supports ongoing education in Indonesia, namely learning at home with the help of parents. The emergence of the Zoom application as a learning medium during the COVID-19 pandemic provides new insights. The Zoom application is a form of distance education,

which can be used for two-way communication between teachers and students (McCoy, 2016). Social media has also emerged as a widely used learning medium; learning using social media has strengths in learning flexibility and provides solutions to demographic boundaries (Kumar & Nanda, 2018).

CONCLUSION AND IMPLICATIONS

There are four trends found after an analysis of 41 research articles. Trends in research subjects found that 24 studies discuss online learning by utilising the internet; this trend is the most popular among other research subjects. Trends in research methods used are library research, as many as 14 studies making it the most widely used research method. The most commonly employed learning media trends in research are Google Classroom, which is eight studies using it, and WhatsApp with as many as five reviews. The trend of merging more than one learning media used simultaneously, learning media that are combined all utilise the internet in its use. The use of social media applications in education in Indonesia seems to be a sign that education in Indonesia has progressed with the times. The results of this study provide new insights to fill the knowledge gap regarding educational technology in the territory of Indonesia; although the Indonesian state has various limitations in the field of educational technology, it is still trying to keep up with the development of educational technology, especially during the COVID-19 pandemic. Online learning must be carried out as long as education is still carried out without face to face.

LIMITATIONS AND RECOMMENDATIONS

The limitation of this article is that there are still no scientific articles originating from reputable journals indexed by Scopus or Web of Science (WoS); the overall citation of the article comes from the territory of Indonesia. The recommendations form the need to research educational technology trends in the Asia-Pacific region on a larger scale and look at educational technology gaps with other areas, such as Europe, Africa and America.

REFERENCES

Addi-Raccah, A., & Yemini, M. (2018). What is up? Parental WhatsApp discussion groups in diverse educational settings in Israel. *Multicultural Education Review*, *10*(4), 310–326. https://doi.org/10.1080/2005615X.2018.1532224

Al-Ajlan, A., & Zedan, H. (2008). Why Moodle. Paper presented at the 12th IEEE International Workshop on Future Trends of Distributed Computing Systems, Kunming, China, 21–23 October, pp. 58–64. https://doi.org/10.1109/FTDCS.2008.22

Almarzooq, Z. I., Lopes, M., & Kochar, A. (2020). Virtual learning during the COVID-19 pandemic. *Journal of the American College of Cardiology*, *75*(20), 2635–2638. https://doi.org/10.1016/j.jacc.2020.04.015

Anglin, G. J. (1995). *Instructional technology: Past, present, and future*. Libraries Unlimited.

Baydas, O., Kucuk, S., Yilmaz, R. M., Aydemir, M., & Goktas, Y. (2015). Educational technology research trends from 2002 to 2014. *Scientometrics*, *105*, 709–725. https://doi.org/10.1007/s11192-015-1693-4

Bozkaya, M., Erdem Aydin, I., & Genc Kumtepe, E. (2012). Research trends and issues in educational technology: A content analysis of tojet (2008–2011). *Turkish Online Journal of Educational Technology*, *18*(4), 46–61.

Caffarella, E. P. (1999). *The major themes and trends in doctoral dissertation research in educational technology from 1977 through 1998*. Paper presented at the National Convention of the Association for Educational Communications and Technology, Houston, Texas, 10–14 February.

Castro, R. (2019). Blended learning in higher education: Trends and capabilities. *Education and Information Technologies*, *24*, 2523–2546. https://doi.org/10.1007/s10639-019-09886-3

Chick, R. C., Clifton, G. T., Peace, K. M., Propper, B. W., Hale, D. F., Alseidi, A. A., & Vreeland, T. J. (2020). Using technology to maintain the education of residents during the COVID-19 pandemic. *Journal of Surgical Education*, *77*(4), 729–732. https://doi.org/10.1016/j.jsurg.2020.03.018

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Erdogmus, F. U. (2009). Research trends in CEIT MS and PHD theses in Turkey: A content analysis. *Middle East Technical University*, *2*(5), 255.

Gülbahar, Y., & Alper, A. (2009). A content analysis of the studies in instructional technologies area. *Ankara Universitesi Egitim Bilimleri Fakultesi Dergisi*, *42*(2), 93–112. https://doi.org/10.1501/egifak_0000001178

Harzing, A. W. (2020). *Publish or Perish*. https://harzing.com/resources/publish-or-perish

Hiltz, S. R., & Turoff, M. (2005). Education goes digital: The evolution of online learning and the revolution in higher education. *Communications of the ACM*, *48*, 59–64. https://doi.org/10.1145/1089107.1089139

Hrastinski, S., & Keller, C. (2007). An examination of research approaches that underlie research on educational technology: A review from 2000 to 2004. *Journal of Educational Computing Research, 36*(2), 175–190. https://doi.org/10.2190/H16L-4662-6000-0446

Huang, R., Spector, J. M., & Yang, J. (2019). Educational technology a primer for the 21st century. *Journal of Educational Television, 1*(2), 26–27. https://doi.org/10.1080/1358165750010212

Hwang, G. J., & Wu, P. H. (2012). Advancements and trends in digital game-based learning research: A review of publications in selected journals from 2001 to 2010. *British Journal of Educational Technology*, *43*(1), E6–E10. https://doi.org/10.1111/j.1467-8535.2011.01242.x

Januszewski, A., & Molenda, M. (2013). *Educational technology: A definition with commentary*. New York: Routledge. https://doi.org/10.4324/9780203054000

Jung, I., & Yoo, M. (2014). An analysis of Asia-Pacific educational technology research published internationally in 2000–2013. *Asia Pacific Education Review*, *15*(3), 355–365. https://doi.org/10.1007/s12564-014-9323-z

Keser, H., & Özcan, D. (2011). Current trends in educational technologies studies presented in World Conferences on Educational Sciences. *Procedia - Social and Behavioral Sciences*, *15*, 3989–3998. https://doi.org/10.1016/j.sbspro.2011.04.403

Khe, F. H., Kale, U., & Nari, K. (2007). Past research in instructional technology: Results of a content analysis of empirical studies published in three prominent instructional technology journals from the year 2000 through 2004. *Journal of Educational Computing Research*, *36*(3), 269–300. https://doi.org/10.2190/K3P8-8164-L56J-33W4

Kimmons, R., Rosenberg, J., & Allman, B. (2021). Trends in educational technology: What Facebook, Twitter, and Scopus can tell us about current research and practice. *TechTrends*, *65*(2), 125–136. https://doi.org/10.1007/s11528-021-00589-6

Krippendor, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Sage Publications. https://doi.org/10.1103/PhysRevB.31.3460

Kucuk, S., Aydemir, M., Yildirim, G., Arpacik, O., & Goktas, Y. (2013). Educational technology research trends in Turkey from 1990 to 2011. *Computers and Education*, *68*, 42–50. https://doi.org/10.1016/j.compedu.2013.04.016

Kumar, V., & Nanda, P. (2018). Social media in higher education. *International Journal of Information and Communication Technology Education*, *15*(1), Article 7. https://doi.org/10.4018/ijicte.2019010107

Kumaran, K. S., & Nair, V. M. (2010). *Future trends in e-learning*. Paper presented at the 4th International Conference on Distance Learning and Education (ICDLE) Proceedings, San Juan, Puerto Rico, 3–5 October. https://doi.org/10.1109/ICDLE.2010.5606011

Logofătu, B., Andreea, V., & Ungureanu, C. (2015). Google Classroom: The new educational challenge. Pilot test within the department for distance learning. *ELearning & Software for Education, 2,* 493–499. https://doi.org/10.12753/2066-026X-15-166

Martínez, R. A., & Duart, J. M. (2016). New collaborative learning trends in e-learning: Keys for it effective implementation. *Estudios Pedagogicos*, *42*(1) [Online]. https://doi.org/10.4067/S0718-07052016000100017

McCoy, K. (2016). When distance is the issue: Using Zoom, cloud based video web conferencing system: Perspectives, possibilities & potential in higher education. In G. Chamblee, & L. Langub (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2016* (pp. 301–304). Savannah, GA: Association for the Advancement of Computing in Education (AACE).

Mishra, S., Sahoo, S., & Pandey, S. (2021). Research trends in online distance learning during the COVID-19 pandemic. *Distance Education*, *42*(4), 494–519. https://doi.org/10.1080/01587919.2021.1986373

Mona, N. (2020). Konsep isolasi dalam jaringan sosial untuk meminimalisasi efek contagious (Kasus penyebaran virus Corona di Indonesia). *Jurnal Sosial Humaniora Terapan, 2*(2), 117–125.

Natividad, G., Spector, J. M., & Evangelopoulos, N. (2018). Research topics and trends in educational technology. In *An analysis of two decades of educational technology publications* (pp. 85–94). Springer. https://doi.org/10.1007/978-981-13-0137-7_5

Neuendorf, K. A. (2001). *The content analysis guidebook*. Sage Publication.

Nguyen, D. T., & Chung, K. T. (2020). New trends in technology application in education and capacities of universities lecturers during the Covid-19 pandemic. *International Journal of Mechanical and Production*, *10*(3), 1709–1714.

Oliver, M., & Trigwell, K. (2005). Can 'Blended Learning' be redeemed? *E-Learning and Digital Media*, *2*(1), 17–26. https://doi.org/10.2304/elea.2005.2.1.17

Osipovskaya, E., & Miakotnikova, S. (2020). Using gamification in teaching public relations students. In *Advances in Intelligent Systems and Computing* (pp. 685–696). Springer. https://doi.org/10.1007/978-3-030-11932-4_64

Ramadhani, R., Umam, R., Abdurrahman, A., & Syazali, M. (2019). The effect of flipped-problem based learning model integrated with LMS-google classroom for senior high school students. *Journal for the Education of Gifted Young Scientists*, *7*(2), 137–158. https://doi.org/10.17478/jegys.548350

Ross, S. M., Morrison, G. R., & Lowther, D. L. (2020). Educational technology research past and present: Balancing rigor and relevance to impact school learning. *Contemporary Educational Technology*, *1*(1), 17–35. https://doi.org/10.30935/cedtech/5959

Shaharanee, I. N. M., Jamil, J. M., & Rodzi, A. S. S. M. (2016). The application of Google Classroom as a tool for teaching and learning. *Journal of Telecommunication, Electronic and Computer Engineering*, *8*(10), 5–8.

Şimşek, A., Özdamar, N., Uysal, Ö., Kobak, K., Berk, C., Kiliçer, T., & ÇIğdem, H. (2009). Current trends in educational technology research in Turkey in the new millennium. *Kuram ve Uygulamada Egitim Bilimleri*, *9*(2), 961–966.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, *15*(3), 398–405. https://doi.org/10.1111/nhs.12048

Valverde-Berrocoso, J., del Carmen Garrido-Arroyo, M., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-Learning: A systematic literature review (2009-2018). *Sustainability (Switzerland)*, *12*(12), 5153. https://doi.org/10.3390/su12125153

Vijayakumar, S., & RameshBabu, V. (2016). Emerging trends and technologies mobile apps for education perspective. *Asia Pacific Journal of Research*, *1*(11), 171–173.

Viner, R. M., Russell, S. J., Croker, H., Packer, J., Ward, J., Stansfield, C., Mytton, O., Bonell, C., & Booy, R. (2020). School closure and management practices during coronavirus outbreaks including COVID-19: A rapid systematic review. *The Lancet Child and Adolescent Health*, *4*(5), 397–404. https://doi.org/10.1016/S2352-4642(20)30095-X

Wilder-Smith, A., & Freedman, D. O. (2020). Isolation, quarantine, social distancing and community containment: Pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. *Journal of Travel Medicine*, *27*(2), 1–4. https://doi.org/10.1093/jtm/taaa020

Woolf, N. H., & Silver, C. (2017). *Qualitative analysis using nvivo: The five-level QDA® method*. New York: Routledge. https://doi.org/10.4324/9781315181660