Digital Culture in Higher Education: Lost in Digital Transformation

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Abstract. The transition from traditional pedagogy into modern pedagogy in the higher education environment shows that higher education institutions are capable of moving toward digital transformation. However, the shift of education to utilizing technology in higher education will never be easy and perfect, even though the transition and change are crucial for future higher education development. The paper suggested that higher institutions could transform by instilling a digital culture among the members. Consequently, various issues and challenges must be highlighted so that the higher institutions' strategic level can develop a strategy to overcome the matters. Due to this, the author highlights the crucial issues and challenges to embracing the digital culture in higher education institutions, which is lost in digital transformation, particularly from the author's perspective as strategic level personnel in the higher institution.

Keywords: Digital Culture, Digital Transformation, Higher Education, Lost in Transformation.

1 Introduction

Digital culture has affected many elements of people's lives. It is a phenomenon that began to exist when people started to use digital technology in so many ways. The digital trends through the Industrial Revolution 4.0 have created a pace that required committees of practice and operation linked with the technologies. Not only do technologies change, but individual also requires appropriate skill, competency, and knowledge to ensure that they have changed positively to avoid the disruption of technological changes. The organization or institution must embrace the right culture to improve its operation to compete with other organizations or institutions in the industry to gain competitive advantages. Various areas began embracing the digital culture in the industry, such as business, agriculture, healthcare, applied science, medicine, astronomy, etc. Digital culture is identified as both a component of the current digital transformation of society and an epistemological obstacle to the sociological analysis of the same phenomenon [15]. It is also described as the changing relationship between how culture is created and consumed and how new information technology influences the changing in people's lives. The concept of digital culture focuses on the technology itself [1]. Meanwhile, [13] conceptualized that digital culture refers to values, agreements, and thoughts

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within today's society and how people communicate. The current definition of digital culture has been described by [18], who states that digital culture is about ideas, actions, collaboration, and flexibility. Besides that, [37] added that digital culture is a type of culture that separates an organization from others and executes digital transformation. Meanwhile, [14] has a detailed definition of digital culture. It can be understood as the set of habits, practices, and social interactions from digital technological resources. Based on a recent study by [30], digital culture is defined as a new form of culture in which the culture of humanity will digitalize and turn into a new form. Digital culture is the whole lifestyle and habits created by the innovations brought by the age in which human beings live, with technology taking more place in daily life.

2 Visual Framing Digital Culture in Higher Education

In the spectrum of the education world, the digital culture is an essential social change towards innovation, decision-making, effective use of technology, attracting new talents, and enhancing the skills and competencies of current educators, learners, and administration staff. The innovation aspect is vital in building educators' and learners' creativity and new ideas for the sustainability of the higher education sector. Digital culture also refers to students' behaviour, ethics, and participation in Internet technology and communication as part of the learning process and environment [40]. The educator will create a new innovative generation in which the learner will have a high level of thinking, particularly creating new ideas and mindset of the graduate student towards the country's development. The innovative mindset graduates will lead the future nation by providing new ideas, initiatives, and strategic planning to discover and expand the technology for the nation's development. Excellent graduates with innovative mindsets and ideas will provide the best decision-making for their self-development and the country's development. Being creative graduates and educators indirectly could attract new talents and enhance the current creativity and mindset of the staff of higher learning institutions and the education sector. At the same time, the teaching and learning process will be effectively implemented when the educator can accept and use the technology properly during teaching and learning. Generally, these are some essential components of the digital culture in higher education institutions. The digital culture emerges based on the demands from the latest Industrial Revolution 4.0 trends toward digital transformation, particularly in higher education.

Digital transformation brings higher education to move forward by adopting technology in the system to improve education quality, which aligns with the Sustainable Development Goals (SDG) no. 4. It is to ensure the inclusive and equitable quality of education and lifelong learning opportunities for all [36]. In an established digital culture, human and technological factors are crucial in successfully shaping the digital culture in the higher education system. The human element consists of students, educators and administration staff who administer the institutions. The technological factors include advanced technologies such as artificial intelligence (AI), virtual reality (VR), cloud technologies and social media to embed in teaching and learning. The emergence of technology concerned with the human factor could build a culture of digitalization or digital culture. However, the transition process from traditional to modernization raises various issues and challenges from different aspects of the institution and human life. These issues and challenges could be a problem for the institution to enhance their digital transformation in higher education towards a better quality of

education for students who will administer the nation in the future. Various issues and challenges in embracing the digital culture that could be a barrier to higher education institutions are the paper's main focus and will be further discussed.

3 Resistant to Change

According to [20], educational changes require a great effort on the part of the entire educational community and, above all, the active involvement of educators. However, the resistance to change towards educational technology among the academic community is one of the issues and challenges that need to be assessed by the leader in a higher education institution. Hence, there is a need to change the mindset of educators towards the usage of educational technology in the classroom to meet the current trends and demands of learners [26]. Consequently, the lack of skill and knowledge in utilizing educational technology capabilities in the classroom among educators in higher education institution exist nowadays. The transition of the traditional pedagogy towards contemporary culture in which technology becomes the tool to deliver information to the learner requires the right and appropriate skill and knowledge. Without the skill and knowledge of the technical process, it will become a barrier for the educator to utilize the technology entirely. According to [26], there are several reasons the educator resistance to technology usage consist of:

a) Anger - The educator gets angry when the computer crashes.
b) Fear - Fear that technology will take over their educator role.
c) Embarrassed - Some educators are embarrassed because they are not experts in using education technology.
d) Time - Teachers resist technology use if adequate and comfortable time is not given to them to learn.
e) Fear of Failure - No teacher wants to be embarrassed in front of his/her students as most have not firmly grasped the technology.
f) No continuing training - The educator not keep practicing in using the educational technology
g) Lack of skill - Some teachers do not possess the adequate skills to implement technology in their classrooms.

That reason has hindered educators from using educational technology. However, the educator should begin openly accepting the presence of educational technology nowadays. The educator should learn and understand the importance of technology that deals with the newest generation, e.g., Generation Alpha, who are born with the advancement of technology. Generation Alpha is born watching their parents using a mobile phone, computer devices, cloud computing technologies, robotics, artificial intelligence-based technology, and many more in their daily routine. Some parents give their children the smartphone to watch YouTube to make sure they keep calm rather than show tantrums in public places. This scenario required the educator to know how to deal with this generation, mainly by using digital technology in the field of education. The way Generation Z and Generation Alpha learn has never been the same as the past generation. Generation Alpha are babies born within 2010 and are now in Standard 6. Can you imagine what will occur in this generation when they have tutors who are deficient in the technical know-how and usage of this technology? The worst case may be that the educator and learner would not communicate very well, and the

information being delivered to the student will never succeed or be thwarted. So, it is a must for an educator to shift their perspective and become a 21st-century educators.

4 Digital Illiterate

The current generation has placed technology as an essential tool for developing the country. They should be considered and invest in digital talents to compete with other developed and developing countries and achieve the goal of building a technological country. However, being digital illiterate has become an obstacle to using educational technology. According to [19], digital illiteracy is the lack of ability and skills to create, evaluate, learn, and find information on online media and digital platforms through technology. The academic community who are not technology literate or semi-skilled in technology adoption will be lost in digital transformation. The resistance to adopting advanced technology will result in a low level of digital literacy in the academic community. Besides that, a previous study revealed that teachers with low digital literacy prefer to use technological devices less in lessons. In contrast, those with sufficient digital literacy skills can use technological devices more effectively [4]. This has been influenced by teacher belief in the traditional philosophy of education had a negative and significant effect on educators' digital literacy level through their resistance to change in educational technology. The openness to change, flexibility and innovative involvement are necessary for the teaching profession and modern teachers. They have become a significant part of the value system [39] in today's education sector.

Along with technological advancement, digital literacy competence is required in the current technological age [4]. The 21st-century educator and learner should be able to utilize technological advancement in teaching and learning in formal education. The academic community should have enough capability to evaluate, search and find information and the proper techniques in using the technology. The educator also should have the capabilities to utilize the Information, Communication and Technology (ICT) capabilities in the digital age. They should improve their ICT skills and knowledge to provide a high-quality teaching and learning process in the class. [34] state that developing the educator's skill improves the student's skill. Educators must improve their technical skills and acknowledge the digital changes and transformations within the education world. Other than that, higher institutions can produce graduate students with a vision and mission for the future nation's development. The learner's behaviour, mindset and thinking should align with trends and evolutions of current technologies. Higher institutions must ensure the communities are low digital illiterate to implement a highly digital culture.

5 Lack of Resources

Another issue or challenge in embracing the digital culture in higher education is the lack of resources that equip educators and students during teaching and learning activities in the institutions. The educator can be hindered from accommodating the digital environment when there is a lack of resources in terms of hardware, software, time, and technical support. Routine access to the hardware (i.e., laptops or tablets), software (e.g., reading and writing software, internet browsers), and internet connection is a fundamental requirement [17] for a digital culture environment in education. The lack of infrastructure, particularly technology or

internet infrastructure, is also responsible for the slow adaptation of digital culture in the academic community. The old hardware and software and shortage of technical support staff make it more likely for educators to maintain the traditional teaching pedagogy and force them to remain in their comfort zones. This has been supported by [5], which states that many reasons discourage educators from using the technology, one of which is the absence of ICT expertise for teachers. However, possessing digital technology, such as hardware and software, does not guarantee the integration of the technology. Other than that, the lack of quality internet infrastructure will significantly reduce the motivation of educators and students to adopt the digital learning experience [25]. Technology adoption is never an easy process. Thus, using digital technology is a part of the learning process in the academic community. The educator and learner must practice daily and constantly discover new knowledge and technical skill using the technology. This way, adopting technology will assist the educator and learner in the immersive learning experience in the digital age.

In many countries, the lack of resources for technology devices can be seen among learners who stay in rural or remote areas. The socioeconomic status and internet infrastructure in such areas are relatively minimal compared to the urban areas. The poor connections and absence of these technological devices, such as computers, is a considerable challenge for rural learners to collaborate in the learning experience via an online platform [3]. Besides that, the internet subscription also influences the learner's participation during online learning. Usually, the high internet speed will allow viewing the educator's image during a teaching or learning process. However, poor connectivity will hinder the learner and educator from fully experiencing online learning. [24] agrees that the availability of resource and the way it is spent can influence the student's learning opportunities. In other words, without sufficient resources, the student's or learner's performance in the virtual learning experience will be highly affected and eventually thwarted. Higher education institutions may not have any problem getting good infrastructure, hardware, and software because the universities have allocations for these devices. However, some universities have the initiative to hold donations among the staff or alums to assist the student or learner in receiving devices such as laptops. This scenario has been implemented by many institutions worldwide such as in developed countries to hold donations among staff and alums to give learners laptops among the group of students whose parents have income below average. Through this initiative, the students in this group will receive an affordable laptop that can be used to experience online learning from home.

6 Digital Inequality

Digital inequality is another challenge in instilling a digital culture among the community in higher education institutions. Digital inequality is the digital divide, defined as the disparities in knowledge and ability to use digital and information technology among individuals with different demographics, socioeconomic backgrounds, digital and information technology experience, and competencies [10]. The abilities of these groups of people may be because of their socioeconomic status, income generation, geographical restriction, lack of motivation to use technology and digital illiteracy, which contributed to digital inequality. Digital inequality shows that the accessibility to connected devices must have basic or proper facilities or equipment to stay connected to the internet. That is why socioeconomic status is significantly essential in assessing digital inequality. The disadvantaged group may be unable to afford the

appropriate devices to connect to internet technology. [38] stated that the dimension of digital inequality could refer to the usage, skill, access, motivation, and aim to use the technology. Without the skill and purpose of using technology, the individual will never want to know, understand, utilize, and explore educational technology.

In higher education, learners from rural areas may have problems with the internet infrastructure, which can affect the online learning experience. The previous studies show that the learner does not have stable internet access and is not able to participate in class without disruption [6]. Even though there are equipped with internet infrastructures, it will never be the same for the learners who stay in urban areas. The internet speed in urban areas is faster rather than in rural areas. The learner may have internet connectivity problems, especially during lectures when the lecturer conducts the video meeting through an online platform. [22] also state that some students argued that the face-to-face online application was ineffective for learning due to an unstable network. Besides that, the learner in the Millennial, Z and Alpha generations will have no problem gaining skills and knowledge in using the technology. However, the silent educators among the Baby Boomers generation may have difficulty changing traditional teaching and learning into an online learning environment. [33] raised that educators face several obstacles in utilizing technological media, such as not being able to use computers, not being able to use PowerPoint as a learning medium, and being unable to utilize the internet properly. This leads the educator to resistance to embracing the change towards an online learning environment. These issues and problems will hinder them from fully utilizing the digital environment in the education sector.

7 Digital Disruption

Digital disruption is another challenge to embracing the digital culture in higher institutions. Digital disruption refers to a system's digitalization [12]. The disadvantages of disruptive technology will change the traditional culture of the current education environment into technological innovation. The advent of technological innovation with the application of intelligent devices for various uses, such as social media applications, has reduced face-to-face interaction and led to limited acquiring the relevant soft skill such as emotional intelligence, communication, and interpersonal skills, especially among the younger population [27]. At the same time, the educator faces difficulty in preparing the teaching material for online methods, which is time-consuming [32]. Online learning also impacts the disabled, underprivileged and marginalized learners with limited access to resources and accessibility to online learning [35]. Thus, these learners must put extra effort into participating in online learning environments.

Technology is the core concept necessary to adopt among the industry and various institutions, especially during the outbreak pandemic Covid19. Therefore, the current catastrophic pandemic Covid19 has become the path that's urged education sectors to adopt the digital solution by implementing e-learning within the education sector in delivering knowledge to the learner. The pandemic Covid19 also generated changes in the teaching and learning process as well as influenced the interaction between educator and learner [11]. Moreover, people affirming the new technological environment has sparked a bombshell experience for the community and are overwhelmed by its advantages. The community of practice cannot quickly adapt to the changes in technology as it has suddenly affected how they deliver the lesson to the students. This situation will slow down the process of cultivating the digital culture.

Even though the convergence and embracing of these disruptive technologies may be progressively slow, future education must utilize this technology to disrupt the teaching and learning environment worldwide. The elements such as edutainment will become the essential core components to make the teaching and learning environment more interactive and attractive to the learner to entertain the formal education. According to [23], improving learning activities is the only way to handle the digital environment in education. The educators had to find ways to adopt online teaching methods and platforms such as web-based video conferencing or video meetings. This technology disruption significantly impacts the learner, educator, and administration staff. Thereby causing educators to explore the digital tools that could be used during the teaching and learning process. On the other hand, learners also need to adapt to the video conferencing format, where they focus on the screening rather than face-to-face (f2f) interaction. For example, Google Hangout and Zoom are the standard video conferencing platforms that educators use in synchronous online teaching and learning [16]. Parents are also affected by this kind of environment as they must spend some money to purchase technological devices and to learn to set up applications that might be strange to them for the sake of their children. [21] state that parents influence their children by providing digital technologies, and a proper learning environment, to support them. This new situation heavily burdens caregivers and parents [9]. It shows how disruptive technologies have affected the higher education sector.

8 Security and Safety

The Digital Culture gives users freedom and the ability to creatively use digital technology to emerge new paths of knowledge transfer, the democratization of the information-obtaining system, unprecedented creativity, and self-realization of its users [7]. Thus, the security and safety of users are other challenges that could hinder the adoption of the digital culture in the higher education system. The users access thousands of pieces of information without considering the risk-related consequence of taking information from unreliable sources when using the technology. Excessive technology, such as the internet, will negatively affect average communication skills, such as conversational skills, listening, and eye contact [28]. A user's physical and psychological well-being is highly exposed to a risk associated with emotional management, such as distress, anger, loss of control and pushing others, which may cause them to isolate themselves from the real world. The learner may have poor communication skills in real life when they only communicate with their classmate on the online platform. Moreover, the learner also feels isolated from their educator, the content of the courses as well as their classmate [2]. These are all issues related to security and safety.

In higher education, several studies state that the implementation of online learning will decrease the motivation to learn, impair cognitive function and cause harmful effects on interpersonal communication skills as well as a healthy lifestyle [8]. Digital learning will demotivate the learner to learn because the teaching and learning environment has entirely changed. The face-to-face interaction during the teaching and learning process is being replaced with online learning, where the learner does not interact with their educator in a natural environment may likely affect their motivation to learn. This scenario will affect their communication and interaction skills with their educator. Moreover, they also will be awkward interacting with their classmate through online platforms. In real life, the F2F interaction will teach the learner to respect the educator when they see the teacher or lecturer

outside the classroom rather than in an online platform. In addition, the technology may also diminish their health status as some users spend the whole day surfing on the online platform. Eye strain and another Computer Visual Syndrome (CVS) can quickly happen to the learner [29]. This has been supported by [31]. Eyestrain from too much screen time will result in eye irritation, dryness and fatigue, blurred vision, and other problems. This may cause their bodies and eyesight to be severely damaged as they give themselves to accomplishing their tasks and assignments. Too much screen time will affect their musculoskeletal and nervous systems, leading them towards an unhealthy lifestyle of the learner. All these are the negative effect that contributes to digital usage and digital culture among learners in higher education institutions.

9 Conclusion

This paper discussed the issues and challenges towards digital transformation in the higher education sector. The higher education institution needs to handle six issues and challenges to embrace a digital culture: resistance to change, lack of resources, digital inequality, digital skill and competency, digital disruption, and security and safety. These issues and challenges have hindered the higher education institution from embracing the digital culture in the community. Digital culture must be in place and appropriately instilled among the community in higher education institutions to implement digital education successfully. Other than that, the institution should also focus on the learner's behavior and attitudes which are important attributes towards embracing technology adoption, which could lead to the development of digital culture in the education sector.

References

[1] Ayala-Perez, T., & Joo-Nagata, J. (2019). The digital culture of students of pedagogy specialising in the humanities in Santiago de Chile. Computers & Education, 133, 1-12.

[2] Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during the Covid-19 pandemic. Asian Education and Development Studies.

[3] Adarkwah, M. A. (2021). "I'm not against online teaching, but what about us?": ICT in Ghana post Covid-19. Education and Information Technologies, 26(2), 1665-1685

[4] Alanoglu, M., Aslan, S., & Karabatak, S. (2022). Do teachers' educational philosophies affect their digital literacy? The mediating effect of resistance to change. Education and Information Technologies, 27(3), 3447-3466.

[5] Al-Mamary, Y. H. S. (2022). Examining the factors affecting the use of ICT in teaching in Yemeni schools. Journal of Public Affairs, 22(1), e2330.

[6] Basar, Z. M., Mansor, A. N., Jamaludin, K. A., & Alias, B. S. (2021). The Effectiveness and Challenges of Online Learning for Secondary School Students–A Case Study. Asian Journal of University Education, 17(3), 119-129.

[7] Baeva, L., & Grigorev, A. (2020). Safety of Digitalization of Educational and Social Space. Pakistan Journal of Distance and Online Learning, 6(1), 231-246.

[8] Bolatov, A. K., Seisembekov, T. Z., Askarova, A. Z., Baikanova, R. K., Smailova, D. S., & Fabbro, E. (2021). Online-learning due to COVID-19 improved mental health among medical students. Medical science educator, 31(1), 183-192.

[9] Chang, G.C., & Satako, Y. (2020). How are countries addressing the Covid-19 challenges in education? A snapshot of policy measures. World Education Blog. https://www.gecv.ac.in/uploads/ssip/UNESCO%20snap%20shot%20for%20 maintaining%20education.pdf.

[10] Cai, Y. (2016). Consumers' Adoption of Online Shopping in China. In Encyclopedia of E-Commerce Development, Implementation, and Management (pp. 1572-1581). IGI Global.

[11] Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. Sustainability, 12(24), 10367.

[12] Enokela, A. A. (2022). Pedagogical Benefits and the Future of Digital Education With a Focus on Teaching and Learning Processes. EdTech Economy and the Transformation of Education. Retrieved October 2022, from: https://www.igi-global.com/chapter/pedagogical-benefits-and-the-future-of-digital-education-with-a-focus-on-teaching-and-learning-processes/305902

[13] Ertem-Eray, T. (2019). The Status of Digital Culture in Public Relations Research in Turkey: An Analysis of Published Articles in 1999-2017. In Handbook of research on examining cultural policies through digital communication (pp. 292-307). IGI Global

[14] Ferreira, J. D. L. (2021). Digital Culture and Teacher Education: an analysis of undergraduate students' perspective in Pedagogy. Educar em Revista, 36.

[15] Guy, J. S. (2019). Digital technology, digital culture and the metric/nonmetric distinction. Technological forecasting and social change, 145, 55-61.

[16] Izhar, N. A., Al-Dheleai, Y. M., & Ishak, N. A. (2021). Education continuation strategies during COVID-19 in Malaysia. International Journal of Academic Research in Business and Social Sciences, 11(4), 1423-1436.

[17] Johnson, A. M., Jacovina, M. E., Russell, D. G., & Soto, C. M. (2016). Challenges and solutions when using technologies in the classroom. In Adaptive educational technologies for literacy instruction (pp. 13-30). Routledge.

[18] Kavanaugh, J. (2019). Cultivating digital cultures. Strategic HR Review, 19(1), 2–6. https://doi.org/10.1108/SHR-11-2019-0083

[19] Keçi, I., & Qosja, E. (2021). Tourism Education During the Pandemic: Is Distance Education a Solution?. In Handbook of Research on the Impacts and Implications of COVID-19 on the Tourism Industry (pp. 863-884). IGI Global.

[20] Lomba-Portela, L.; Domínguez-Lloria, S.; Pino-Juste, M.R. Resistances to Educational Change: Teachers' Perceptions. Education Science 12(359). Retrieved

October 2022, from: https://doi.org/ 10.3390/educsci12050359

[21] Misirli, O., & Ergulec, F. (2021). Emergency remote teaching during the COVID-19 pandemic: Parents experiences and perspectives. Education and information technologies, 26(6), 6699-6718.

[22] Nartiningrum, N., & Nugroho, A. (2020). Online learning amidst global pandemic: EFL students' challenges, suggestions, and needed materials. ENGLISH FRANCA: Academic journal of English language and education, 4(2), 115-140.

[23] Nuraini, U., Nagari, P. M., Han, C. G. K., & Nuris, D. M. R. (2021, January). Students' perceptions of digital disruption in learning. In Conference on International Issues in Business and Economics Research (CIIBER 2019) (pp. 115-121). Atlantis Press.

[24] OECD (2012). Equity and quality in education: Supporting disadvantaged students and schools. OECD Publishing. Retrieved March 2022, from: https://www.oecd.org/education/school/50293148.pdf

[25] Organisation for Economic Co-operation and Development. (2020). The potential of online learning for adults: early lessons from the COVID-19 crisis. OECD Publishing.

[26] Oriji, A., & Amadi, R. (2016). E-education: Changing the mindsets of resistant and saboteur teachers. Journal of Education and Practice, 7(16), 122-126.

[27] Oke, A., & Fernandes, F. A. P. (2020). Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). Journal of Open Innovation: Technology, Market, and Complexity, 6(2), 31.

[28] Ortiz, A. A. (2017). Negative effects of technology on children. Go San Angelo. Retrieved October 2022, from: https://www.gosanangelo.com/story/life/wellness/2017/04/19/sound-mind-negative-effects-technology-children/99872132/

[29] Octaberlina, L. R., & Muslimin, A. I. (2020). EFL students' perspective towards online learning barriers and alternatives using Moodle/Google Classroom during COVID-19 pandemic. International Journal of Higher Education, 9(6), 1-9.

[30] Senbursa, N. (2021). The Future of Maritime Business Management and Leadership in Global Business Sustainability and Remote Work. In Remote Work and Sustainable Changes for the Future of Global Business (pp. 262-283). IGI Global.

[31] Seidman, B. (2015). What too much screen time does to your eyes. CBS News. Retrieved October 2022, from: https://www.cbsnews.com/news/screen-time-digital-eye-strain/

[32] Selvanathan, M., Hussin, N. A. M., & Azazi, N. A. N. (2020). Students learning experiences during COVID-19: Work from home period in Malaysian Higher Learning Institutions. Teaching Public Administration, 0144739420977900.

[33] Sahelatua, Lounard Syaulan, Linda Vitoria, Mislinawat. 2018. "Kendala Guru Memanfaatkan Media IT Dalam Pembelajaran Di SDN 1 Pagar Air Aceh Besar". Jurnal Ilmiah Pendidikan Guru Sekolah Dasar 3 (2): 131–40.

https://doi.org/10.1017/CBO9781107415324.004.

[34] Sánchez-Cruzado, C., Santiago Campión, R., & Sánchez-Compaña, M. (2021). Teacher Digital Literacy: The Indisputable Challenge after COVID-19. Sustainability, 13(4), 1858.

[35] The Regional Risk Communication and Community Engagement (RCCE) Working Group (2020) COVID-19: How to include marginalized and vulnerable people in risk communication and community engagement. Retrieved March 2022, from:https://reliefweb.int/sites/reliefweb.int/files/resources/COVID-19_CommunityEngagement_130320.pdf

[36] United Nation (2022). Sustainable Development Goals 4. Retrieved April 2022, from: https://sdgs.un.org/goals/goal4

[37] Ulusoy, B. (2020). Understanding digital congruence in industry 4.0. In Business Management and Communication Perspectives in Industry 4.0 (pp. 17-31). IGI Global.

[38] Van Dijk, J. A. (2012). The digital divide's evolution turns to inequality of skills and usage. In Digital enlightenment yearbook 2012 (pp. 57-75). IOS Press.

[39] Vrabcová, D. (2015). Teachers´ and teacher educators 'attitudes to educational changes: An insight to the Czech Educational System. Procedia - Social and Behavioral Sciences, 171, 472–481.

[40] Zakirovich, M. A. (2022). Technologies for shaping the digital culture of undergraduate students in the information-educational environment. INternational Journal Of Research In Commerce, It, Engineering And Social Sciences ISSN: 2349-7793 Impact Factor: 6.876, 16(2), 30-33.