Teachers' perspectives on technology-based learning for the kindergarten students

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Article Info

ABSTRACT

Ever since the pandemic occured, almost every sector utilize technology to accommodate learning. To tackle every possibility that may interfere the learning process, perspectives in using technology from teachers needed to be taken into account. Thereofore, the needs of finding the perspecives of teachers in teaching and learning especially in kindergarten are crucial since they are still new to the settings. Qualitative research design was applied through Google Form as the media to reach the participants. In collecting the data, the participants were asked about the use of the technology in the teaching and learning process using English as the language of instruction. This research involved eight teachers (T1, T2, T3, T4, T5, T6, T7, T8) of English for young learners in three different schools. Results revealed that there were four main themes which indicated the use of technology in teaching in the kindergarten students, namely: i) Technology motivates children to learn; ii) Technology effects children's health; iii) Technology is an optional medium; and iv) Suitable application are needed for better learning. These findings can be useful for the present and future stakeholders of kindergarten schools especially in the use of information and communication technology (ICT) in the teaching of English as a foreign language (EFL) at kindergarten settings.

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1. INTRODUCTION

Education, through the ages, has undergone many changes from the time when humans only used rocks to draw the caves to these days when having a lecture through technology without leaving the hometown. Technology has been the core of the 21st-century in helping humans to make their lives easier in many aspects such as economy, business, transportation, and education [1]–[4]. Especially for education, technology plays a big role in the development of the education. The initiative encouraged reform to education systems and for educators to see the opportunities that digital technologies provide to support improved teaching and learning [5]. Therefore, technology can be utilized to make the students easier in their development of their education.

Technology is not a new thing for distance learning as some universities offered this mode of learning. For instance, in the 19th-century, Skerry's College in Edinburgh, College Correspondence College in London and the College of Chicago and Illinois Wesleyan College in the USA were considered among the pioneers within the tertiary level [6]. However, distance learning is new to the kindergarten settings mostly in Indonesia. Because of this pandemic, based on the circular letter of the Secretary General no. 15/2020, as cited in Saragih

[7], all the education levels in Indonesia starting from the early childhood education until the tertiary level are required to conduct remote teaching and learning (study from home).

Progressions in schools as well as in colleges and universities can be brought about in a well-organized manner, when technology-based learning are put into practice. Abdullah *et al.* [8] stated that the teachers saw the accessibility of computers as an inspiration for the understudies within the learning process and as an academic potential whereby lessons can be conveyed, clarified or outlined in a more curiously and engaging way. In the 4.0 era nowadays, technology has been the part of daily life where the advancement in information as well as in education are rapidly increased [9], [10]. The research conducted by Gardner *et al.* cited in Williams *et al.* [11] focused on the impact of the pupils' use of portables on learning; however, feedback on participating teachers was also sought. It was reported that the high-level individuals accessed information and communication technology (ICT) which empowered them in the use of ICT and subsequently they are permitted to integrate ICT into their educating and practice more viably. In this manner, there is an increase positive attitude towards the outcomes of using computer. Attitude shaped by beliefs and beliefs with respect to computer use can exist on a few levels. Blumfield [12] found that teachers' beliefs about the unique potential of computers to motivate students and enhance their self-esteem also influence decisions about computer use.

When technology-based learning is put into operation, it is proving to be advantageous to the members in promoting functioning of the educational institutions. However, the individuals need to remain well-equipped with various kinds of technologies and put them into practice on a continuous basis. The students are able to bring about improvements in their academic outcomes through the use of technologies. In the research conducted by Williams *et al.* [11], primary instructors report that ICT gives them with reasonable reinforcement and extension material for students, demonstrating a solid recognition of ICT as an 'add-on' or reward than fundamentally to their core teaching.

The main areas that have been taken into consideration in this research include measures for improving schools, measures for enhancements in technology-based learning, and recommendations. Based on a study conducted by Gilakjani [13] in order to perceive how computer is successfully applied by instructors, it is essential to examine the teachers' beliefs and states of mind. They expressed that other external variables need to be well-managed, such as computer support which will influence their computer employments.

In years of our experience in teaching young learners, we frequently found that children who learn through technology tend to learn better than those who are rarely in touch with the technology. This is also apparent in a review reported by Zomer [14]. Zomer stated that four studies showed that the kindergarten students who learned vocabulary through technology performed better than those who were given another treatment. In the research conducted by Henderson *et al.* [15], it was claimed that advancement and change in educational institutions is exceedingly complex and unexpected on multiple and often-contradictory influences over time. Therefore, it is important to get other insights of the utility of the technology for kindergarten students in their development to learn English.

In light of the consideration, it is very important for an English teacher to pay attention on some strategies that can be used to enhance the English skills of very young learners [15], in this case, learners who are still in kindergarten. Jamaris and Edwita [16] stated that there are many kindergarten students who find difficulties in learning English vocabulary and the cause of the problem is rooted from the strategies and teaching learning media that are not sufficient to support the English class. Internationally, many governments and education providers consider the ways to improve children's learning in digital technologies through teacher education programs [5]. In the research done by Voillot *et al.* [17], the pupils were all prepared with smartphones. All through the story performed by the educator, pupils were welcomed to mimic particular motions together. Smartphones at that point ended up transforming these signals into sounds. For example, technology developed at Institute for Research and Coordination in Acoustics/Music (IRCAM) a certain sort of signals is consequently recognized and a coherent sound is played (footsteps on the floor, the sound of running water, bird chirping). Hence, the utilization of technology in this research has been an advantage to assist the children to develop their learning.

According to Gilakjani [18], he stated that computer technology helped teachers gain correct pronunciation and improved the quality of their pronunciation instruction. Advances in networks, tools and techniques allow greater functionality in the design and delivery of content, improving both synchronous and asynchronous learning experiences significantly, thus enhancing online learning [19]. In addition, perspectives are important to be assessed in terms of completing more information to add to the research that has been done. According to Matravers and Waldow [20], perspectives are to get insight based on the people experience or the inner worlds. Not only taking merely the results of the related research such as the outcome of the learning but also to confirm more deeply on the stakeholders who have been the ones with the first-hand experience. Therefore, this research aimed to know the perspectives of the teachers in the context of kindergarten on the uses of technology-based learning. The research question of this study is: How are the kindergarten teachers' perspectives towards the use of technology in teaching and learning activity?

2. RESEARCH METHOD

2.1. Design

This study utilized a qualitative research design. Qualitative researchers collect descriptive-narrative and visual-nonnumerical data to gain insights into the phenomena of interest [21]. Therefore, the qualitative design is used because we are concerned with the teachers' perspectives on the use of technology especially in kindergarten. Two sets of questionnaires were distributed to three schools with the samples of eight teachers of kindergarten who already taught at least three years. The teachers are not permanent teachers in the schools, thus the school management always look for the perfect teachers to fit in the schools vision and mission. The use of qualitative method provided a clear picture of kindergarten teachers' perspectives on the use of technology in the process of teaching and learning.

2.2. Participants

In this study, there were three schools which were selected to be a part of the population. The selection of the schools was based on the use of technology at the schools and the use of English as the language of instruction. These schools which are known to be national-plus schools and use English as their tool of communication. Hence, we distributed two sets of questionnaires (one contains options and the other one has short or long answers). Out of these teachers at schools, eight teachers became the participants based on the answers to the items of the questionnaires. Instead of using the kindergarten teachers' real names, pseudonyms were used. They were called T1, T2, T3, T4, T5, T6, T7, T8.

2.3. Instrument

The instrument in the form of questionnaire has been validated by a university lecturer who is an expert in the use of ICT in English language teaching or ELT. However, the main instrument of this study is the researchers themselves. Gay *et al.* [21] stated, the researcher is the primary data collection instrument. Another view of qualitative research, according to Lodico *et al.* [22] tools for qualitative measurement must be flexible enough to allow recording of data on complex areas such as the social context for a group's interactions, cultural beliefs and customs, personal interactions and learning processes and multiple viewpoints. As we live in the modern era, technology has been an advantageous tool to anyone including the researchers. Therefore, we used Google Form as the media to reach the participants and to find answers to nthe research question.

2.4. Data collection

There were five phases in qualitative data collection, namely: i) Selecting participants; ii) Gaining permission; iii) Selecting and weighing different data types; iv) Designing recording protocols; and v) Administering data collection [23]. According to Lodico *et al.* [22], ideally, a research team should include partners who come from the setting or group under study. In this research, one of the researchers is from the same setting as the participants, thus the misinterpretation of the answers could be minimized. Data were collected by using electronic email interview questions [23]. There were 12 questions designed for electronic email interview. The Google Form was prepared and sent to the teachers of three different schools. To sum up, written responses were gained from the teachers and their perspectives on the questions related to the use of technology for kindergarten were elicited from the responses.

3. RESULTS AND DISCUSSION

The findings indicated that technology learning of kindergarten could be done both in preschools and kindergarten levels. Children in the pre-school level are in the range of 2 to 4 years old, and children in the kindergarten groups are in the range of 4 to 7 years old. Most of the teachers use laptops as their primary tool for the teaching and learning. According to Neumannn *et al.* [24], with tablets, they felt that children rapidly learnt around shapes and creature sounds and were mindful that places just like the AppStore contain a wide range of learning assets. Therefore, tablet can be one of the medias that can be used to teaching and learning in kindergarten settings. Other media that they use are hand-phones, speakers, and headsets as well as LCD projectors.

When it comes to the benefit of using technology, five (62.5%) of the teachers stated that the use of technology is beneficial for children while the rest of the teahers chose 'sometimes'. However, none of the teacher chose 'no' which means that the use of technology for teaching and learning is beneficial which is also in line with the research conducted by Neumann *et al.* [24]. In the research done by Adebesi *et al.* [3], teachers agreed that using technology saved times as well as minimized the efforts that they do in the classroom. In addition, the responses of 'yes' and 'sometimes' were found in the matter of convenient use of technology in teaching and learning. In contrast with the finding in the research conducted by Edwards *et al.* [25] where the parents admitted that apps or games were beneficial towards their children's recreational purpose but they

inclined towards the educative purposes. Therefore, the selection of technology will be based on its purpose whether to entertain the children or to educate the children.

Another respective findings on the research that was conducted in three countries; Norway, Portugal, and Japan about the use of touchscreen devices on children age 0-3 years old found out that, the information appeared that the participating parents from Norway evaluated highly the benefits of the utilization of touchscreen by their 0–3s although parents from Portugal and Japan also admit that touchscreen device helped them in so many ways for their children [26]. Based on the research conducted by Surahman *et al*. [27], the literature search illustrated that there are two fundamental challenges to online learning in Indonesia, specifically the quality of instructors and infrastructure. Instructor quality is related to the capacity of instructors to utilize information technology within the learning handle which is considered to be exceptionally low which is affected by age and laptop or computer possession.

In line with the research above, finding of the research conducted by Kewalramani and Havu-Nuutinen [28] showed that it is important for teachers to integrate technology for children's engagement in scientific inquiry, instead of depending on hands-on encounters alone. Another discovery from the question raised to the teachers is that listening skill is most likely to be improved during the learning process through technology and followed by reading skill. As for the supervision, according to 75% of the teachers, the children still need it. However, 25% of the teachers chose 'sometimes'. Surprisingly, better result in the learning process by using technology is not always the first option for the teachers. Most of the teachers chose 'sometimes' in response to the question regarding whether or not the students achieve better in learning when they use technology. Important themes in kindergarten teachers' perspectives regarding the use of technology in the teaching and learning process using English as their instruction include: i) Technology motivates children to learn; ii) Technology effects children's health; iii) Technology is an optional media; and iv) Suitable application needed for better learning.

3.1. Technology motivates children to learn

Based on the results of interviews, some kindergarten teachers believed that technology motivates children to learn with English as their instruction. By comparing computer technology and conventional teaching methods, teachers showed their positive views towards technology because it had high capability in teaching listening and reading which were new to them especially during this pandemic of COVID-19. Some of the teachers' opinions are stated:

"*It's more fun*." (T1)

"*Easily to absorb the lesson and students will not feel bored*." (T4)

"*Help children to stay motivated during the learning process*." (T8)

3.2. Technology affects children's health

The interviews represented that the use of technology. According to some teachers, the technology slightly affect the children's health especially their eyesight. The longer they are exposed to the technology, whether it is a laptop or a hand phone, the more likely the students' health is affected. Even though the technology has many advantages, there are also some drawbacks of technology and one of them is concerning with health. Two teachers said:

"*Too much screen time to children is not good for their eyes*." (T2)

"*Bad for their eyes if they always use it*." (T6)

In contrast with the findings on this research, the study conducted by Jensen *et al*. [29] reported that young adolescents do not support the account that young adolescents' advanced technology utilization is related with raised mental-health side effects. Furthermore, Dardanou [26] stated that the Norwegian and Portuguese parents opinions on the use of touchscreen devices were affected by the cultural perceptions where in the time that the children utilize the technology decreased the time that they spent on outdoor.

3.3. Technology is an optional media

The findings demonstrated that teachers use technology as an optional medium of instruction. In other words, technology is not the main medium in the teaching and learning using English. They have used technology when the pandemic broke out through the semester. According to T7, when the students were not able to meet their teachers, using technology will be the next option for them. The opinions of most of the teachers are presented in the following:

"When they can control themselves in using technology." (T2)

"Maybe when the teacher wants to show some videos for the students." (T3)

"In learning character building or teaching numbers and letters." (T4)

"When the teacher wants to teach moral stories, comparison and studying by singing." (T5)

"When it is needed." (T6)

"When the students cannot meet their teacher directly, utilizing technology is the choice they have." (T7)

"When the children know how to use it." (T8)

3.4. Suitable application needed for better learning

Computer technology has never been a threat to teachers' conventional teaching methods. On the contrary, it gave them certain advantages over traditional methods. However, the appropriate application needed to be utilized due to the needs of the students as well as the materials which are taught in the teaching and learning process.

"Nowadays we have a lot of applications that can help us to develop our educational activities; now it depends on the schools" (T2)

"Zoom application." (T3)

"The application that most teachers use nowadays still has some weaknesses. One of them is that the application they use is the free application in which the time provided is limited. The other is that the appearance of the video used has low resolution which causes some distraction in the learning process." (T6)

According to Griffith *et al*. [30], there is rising prove to recommend that interactive application may be valuable and open apparatuses for supporting early academic advancement. Thus, interactive application needs to be included in the teaching and learning in the kindergarten settings. The findings indicated that teaching kindergarten children who used English as their language instruction boosts the students' motivation in learning. Based on the finding from Nuryadi and Widiatmaka [31], as the digital native era, which is inseparably connected to the advanced world, particularly smartphones, understudies will all be motivated to learn with technology-based media. Also, the study from Cahyono and Mutiaraningrum [32] which used internet-based teaching of writing proved that it raised the students' motivation and interest in learning English. As we know that internet-based teaching is quite similar to technology-based learning, although these findings have different objectives as their study concentrated only in writing while this study concentrate in the four skills. Comparing these two findings, it is believed that the motivation in learning English can be elevated by the use of technology.

According to the questionnaires, health is one of the concerns in the teaching and learning with technology. This is caused by the length of screen time which the students used during the lesson. Based on Haslip and Gullo [33], exploring communication, friendship, moral norms, health and nutritional needs, movement, thinking and reasoning, as well as one's community and the natural environment, have been foundations guiding integrative curriculum, pedagogy and daily interactions. This study can be one of the considerations of time management for the use of technology in kindergarten settings. Not only in kindergarten settings, based on the research conducted by Yu *et al*. [34], it stated that the undergraduate university students in China had difficulties in learning through small screens such as mobile phone. This may lead to forcing the eyesight to work more than it supposed to in a way. The research stated that with the amount of excessive immersion through a small screen decrease the students' cognitive engagement and would result negative learning outcome. Haslip and Gullo [33] also stated that, younger children were understood as learning to love the process of diverse facets of human experience and expression rather than primarily being expected to demonstrate discrete academic skills. This means that the environment and the process of the learning can affect the children's motivation in learning. As the first theme of the finding, that technology can motivate the learning process, it still has a lot of considerations such as the screen time for the health of the children's eyes. Positive drivers of change can include, among others, increased understanding of child development, professionalization

of the early childhood workforce, research exposing deficiencies in existing educational systems, public and private funding, improved policy-making, and widespread advocacy [33].

However, the above finding is not in line with the finding from Henderson *et al.* [15]. They found that the uses of technology fit with familiar ways of teaching (and learning). They also stated that there were many examples of technology which are 'working well', meaning that there is sustainability with well-established practices and products. The finding of this study is in contrast with the finding from Henderson *et al.* [15]. They stated, these were forms of technology that worked with, rather than worked against, well-established cultures, traditions and routines of teaching. while the teachers of kindergarten claimed that technology is only an optional medium in which they use it only when they need it. This difference may occur because the difference of the subjects as the study conducted by Henderson *et al.* [15] dealt with higher education students, while this study deals with kindergarten students.

Based on the interviews, the use of computer technology in the teaching and learning process of kindergarten teachers who apply English as the language of instruction may need a suitable application. Just like what Warschauer and Healey [35] emphasized, it is necessary to develop software that could supply an integrated teaching solution and that could support the teaching and learning process. In addition, Farhat and Dzakiria [36] also concluded that we should invent software that: i) Offer diverse, realistic, native speaker models of the language; ii) Provide a language learning curriculum; iii) Assess learner's needs and wants; iv) Identify the best next options for the learner along with practice with the particular skills; v) Make record of students' performance as well as their evaluation; and vi) Be available at any time without any charging of extra payment or advantages.

The finding of the study especially on the fourth theme is consistent with the finding of Haslip and Gullo [33]. The teacher stated technology applications nowadays still have limitations due to the needs of the children. Therefore, with the consideration of what the students want and need, more suitable applications can be invented in the future so that they meet the current needs of the children. To sum up, the teachers' perspectives can give new views to the current development in the area of teaching and learning. The findings can be consistent with findings of other research studies or it can be different from them. However, these findings can be replaced by other findings, which can be affected by the different time of the settings, different participants, and any other interventions. Therefore, one of the highlights of this finding is that suitable applications are needed for the demands of the current requirements both from teachers and for children of kindergarten.

4.   CONCLUSION

This qualitative study explored teachers' views towards the use of technology in the teaching and learning process using English as the medium of instruction in kindergarten settings. Technology has been a major help in teachers' path of teaching and learning especially when an unexpected pandemic happened, such as COVID-19 pandemic. The teachers are surely grateful for the technology, which helped them to teach from home. The result of this research indicated that the teachers held positive views towards technology; so we can say that they accepted technology as an effective tool in the teaching and learning process in kindergarten. The findings indicated that technology granted kindergarten teachers with enjoyable and interactive environment, improved the quality of their listening and reading skill, and provided the information of the needs in the novelty of applications. The results revealed that the students' health must be considered when using technology. Based on the findings, it is highlighted that technology raised students' motivation in learning with English as the medium of instruction.

This study could be extended to English as a foreign language (EFL) teachers who use technology as a teaching and learning tool to examine a repertoire of information related to listening and reading skills. This study can also have some implications not only for EFL teachers but also for EFL learners. In addition, it is suggested that future researchers collaborate with ICT researchers to make a suitable and efficient application to be applied in the teaching and learning process. Briefly stated, teachers should be aware of the advantages that technology brings to their curriculum and the benefits that it brings to their learners' learning process.

REFERENCES

[1]   C. Suardi, A. N. Handayani, R. A. Asmara, A. P. Wibawa, L. N. Hayati, and H. Azis, "Design of sign language recognition using E-CNN," in *2021 3rd East Indonesia Conference on Computer and Information Technology (EIConCIT)*, Apr. 2021, pp. 166–170. doi: 10.1109/EIConCIT50028.2021.9431877.

[2]   J. W. Rojewski and R. B. Hill, "A framework for 21st-century career-technical and workforce education curricula," *Peabody Journal of Education*, vol. 92, no. 2, pp. 180–191, Mar. 2017, doi: 10.1080/0161956X.2017.1302211.

[3]   R. O. Adebisi, N. A. Liman, and P. K. Longpoe, "Using Assistive Technology in Teaching Children with Learning Disabilities in the 21st Century.," *Journal of Education and Practice*, vol. 6, no. 24, pp. 14–20, 2015.

[4]   S. Madakam, R. Ramaswamy, and S. Tripathi, "Internet of things (IoT): a literature review," *Journal of Computer and Communications*, vol. 03, no. 05, pp. 164–173, 2015, doi: 10.4236/jcc.2015.35021.

[5]   K. Murcia, C. Campbell, and G. Aranda, "Trends in early childhood education practice and professional learning with digital technologies," *Pedagogika*, vol. 68, no. 3, Dec. 2018, doi: 10.14712/23362189.2018.858.

[6]   M. R. Simonson, S. E. Smaldino, and S. Zvacek, *Teaching and learning at a distance : foundations of distance education*. North Carolina: IAP, 2015.

[7]   D. Saragih, "Learn from home policy implementation in primary-level student during academic year 2020-2021 in Medan," *Indonesian Journal of Multidisciplinary Science*, vol. 2, no. 7, pp. 2738–2754, Apr. 2023, doi: 10.55324/ijoms.v2i7.476.

[8]   N. A. Abdullah, M. J. Z. Abidin, W. S. Luan, O. Majid, and H. Atan, "The attitude and Motivation of English Language Teachers towards the Use of Computers," *Malaysian Online Journal of Instructional Technology (MOJIT)*, vol. 3, no. 1, pp. 56–67, 2006.

[9]   B. Abersek, "Evolution of competences for new era or education 4.0," in *Impact of Technologies in the Sphere of Education and Educational Research*, 2017, pp. 1–44.

[10]   J. G. S. Goldie, "Connectivism: a knowledge learning theory for the digital age?," *Medical Teacher*, vol. 38, no. 10, pp. 1064–1069, Oct. 2016, doi: 10.3109/0142159X.2016.1173661.

[11]   D. Williams, L. Coles, K. Wilson, A. Richardson, and J. Tuson, "Teachers and ICT: current use and future needs," *British Journal of Educational Technology*, vol. 31, no. 4, pp. 307–320, Oct. 2000, doi: 10.1111/1467-8535.00164.

[12]   P. C. Blumenfeld, "Classroom learning and motivation: clarifying and expanding goal theory.," *Journal of Educational Psychology*, vol. 84, no. 3, pp. 272–281, Sep. 1992, doi: 10.1037/0022-0663.84.3.272.

[13]   A. Pourhosein Gilakjani, N. B. Sabouri, and A. Zabihniaemran, "What Are the Barriers in the Use of Computer Technology in EFL Instruction?," *Review of European Studies*, vol. 7, no. 11, p. 213, Jul. 2015, doi: 10.5539/res.v7n11p213.

[14]   R. N. Zomer, "Technology use in early childhood education: a review of the literature," *Ontario Tech University*, 2014.

[15]   M. Henderson, V. Smart, G. Finger, R. Aston, K. Larkin, and S. H. Chao, "Conditions for successful technology enabled learning," in *ASCILITE 2015 - Australasian Society for Computers in Learning and Tertiary Education, Conference Proceedings*, 2019, pp. 134–142.

[16]   M. Jamaris and Edwita, "Improving environmental awareness of the 4-6 years old children through neurosensory instructional approach," *American Journal of Educational Research*, vol. 3, no. 4, pp. 427–438, 2015.

[17]   M. Voillot, F. Bevilacqua, J. Chevrier, and C. Eliot, "Exploring mmbodied learning for early childhood education," in *Proceedings of the 18th ACM International Conference on Interaction Design and Children*, Jun. 2019, pp. 747–750. doi: 10.1145/3311927.3325347.

[18]   A. Pourhosein Gilakjani, "Teaching pronunciation of english with computer technology: a qualitative study," *International Journal of Research in English Education*, vol. 3, no. 2, pp. 94–114, Jun. 2018, doi: 10.29252/ijree.3.2.94.

[19]   D. Radoiu and C. Enachescu, "Developing a Technology Based Learning Model," no. July. pp. 1–12, 2014. [Online]. Available: http://old.upm.ro/cedtac/Open and Distance Learning at Petru Maior.pdf

[20]   D. Matravers and A. Waldow, *Philosophical Perspectives on Empathy: Theoretical Approaches and Emerging Challenges*. New York: Routledge, 2018. doi: 10.4324/9780429506093.

[21]   L. R. Gay, G. E. Mills, and P. W. Airasian, *Educational research: Competencies for analysis and applications*, 10th ed. New Jersey: Pearson, 2012.

[22]   M. G. Lodico, D. T. Spaulding, and K. H. Voegtle, *Methods in educational research: from theory to practice*. Indianapolis: Jossey-Bass, 2006.

[23]   J. W. Creswell and P. C. N., *Qualitative inquiry and research design: choosing among five approaches*. SAGE Publications, 2013, 2013.

[24]   M. M. Neumann, G. Merchant, and C. Burnett, "Young children and tablets: the views of parents and teachers," *Early Child Development and Care*, vol. 190, no. 11, pp. 1750–1761, Aug. 2020, doi: 10.1080/03004430.2018.1550083.

[25]   S. Edwards, M. Henderson, D. Gronn, A. Scott, and M. Mirkhil, "Digital disconnect or digital difference? A socio-ecological perspective on young children's technology use in the home and the early childhood centre," *Technology, Pedagogy and Education*, vol. 26, no. 1, pp. 1–17, Jan. 2017, doi: 10.1080/1475939X.2016.1152291.

[26]   M. Dardanou *et al.*, "Use of touchscreen technology by 0–3-year-old children: Parents' practices and perspectives in Norway, Portugal and Japan," *Journal of Early Childhood Literacy*, vol. 20, no. 3, pp. 551–573, Sep. 2020, doi: 10.1177/1468798420938445.

[27]   E. Surahman, R. Santaria, and E. I. Setiawan, "Challenges of online learning in Indonesia (in Indonesian)," *Journal of Islamic Education Management*, vol. 5, no. 2, pp. 89–98, 2020.

[28]   S. Kewalramani and S. Havu-Nuutinen, "Preschool teachers' beliefs and pedagogical practices in the integration of technology: a case for engaging young children in scientific inquiry," *EURASIA Journal of Mathematics, Science and Technology Education*, vol. 15, no. 12, pp. 1–13, Jul. 2019, doi: 10.29333/ejmste/109949.

[29]   M. Jensen, M. J. George, M. R. Russell, and C. L. Odgers, "Young adolescents' digital technology use and mental health symptoms: little evidence of longitudinal or daily linkages," *Clinical Psychological Science*, vol. 7, no. 6, pp. 1416–1433, Nov. 2019, doi: 10.1177/2167702619859336.

[30]   S. F. Griffith, M. B. Hagan, P. Heymann, B. H. Heflin, and D. M. Bagner, "Apps as learning tools: A systematic review," *Pediatrics*, vol. 145, no. 1, p. e20191579, Jan. 2020, doi: 10.1542/PEDS.2019-1579.

[31]   M. H. Nuryadi and P. Widiatmaka, "Strengthening civic literacy among students through digital literacy in society 5.0," *Journal of Education and Learning (EduLearn)*, vol. 17, no. 2, pp. 215–220, May 2023, doi: 10.11591/edulearn.v17i2.20746.

[32]   B. Y. Cahyono and I. Mutiaraningrum, "Indonesian EFL teachers' familiarity with and Opinion on the internet-based teaching of writing," *English Language Teaching*, vol. 9, no. 1, p. 199, Dec. 2015, doi: 10.5539/elt.v9n1p199.

[33]   M. J. Haslip and D. F. Gullo, "The changing landscape of early childhood education: implications for policy and practice," *Early Childhood Education Journal*, vol. 46, no. 3, pp. 249–264, May 2018, doi: 10.1007/s10643-017-0865-7.

[34]   Z. Yu, L. Yu, Q. Xu, W. Xu, and P. Wu, "Effects of mobile learning technologies and social media tools on student engagement and learning outcomes of English learning," *Technology, Pedagogy and Education*, vol. 31, no. 3, pp. 381–398, May 2022, doi: 10.1080/1475939X.2022.2045215.

[35]   M. Warschauer and D. Healey, "Computers and language learning: an overview," *Language Teaching*, vol. 31, no. 2, pp. 57–71, Apr. 1998, doi: 10.1017/S0261444800012970.

[36]   P. Akhter Farhat and H. Dzakiria, "Pronunciation barriers and computer assisted language learning (CALL) coping the demands of 21st century in second language learning classroom in Pakistan," *International Journal of Research in English Education*, vol. 2, no. 2, pp. 53–62, Jun. 2017, doi: 10.18869/acadpub.ijree.2.2.53.

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