

Implementation of Technology for Pre-schoolers: A Qualitative Study

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Abstract

The purpose of this study is to investigate preschool teachers' implementation of technology for preschoolers. There are a total of 8 participants selected from the study area. The methodology implemented was using interviews and observations. All of the selected participants agreed that the implementation of technology is crucial for Generation Alpha. However, the negative impact of using technology was the misuse of technology and excessive screen time. The transition of preschool education before the pandemic was visible when the usage of technology was very limited; during the pandemic, technology was fully implemented for online lessons; and during the endemic, preschool teachers implemented technology for hybrid lessons, and at specific periods. There are challenges faced by preschool teachers such as poor internet connectivity, ineffective hybrid lessons, and inadequate ICT skills. Older children faced issues when transitioning from online to physical learning due to their difficulty in adjusting to changes in the routine for physical learning. Therefore, professional training skills, providing adequate ICT tools, stable network connections as well as support from the school's management are the ways to overcome challenges regarding the implementation of technology in preschool classrooms. Lastly, selected participants for this study suggested that individual coaching should be provided to children who faced difficulties when transitioning from online to physical learning. Thus, the researcher concluded that there is a need for preschool teachers, parents, schools, and the government to explore the preschool teachers' implementation of technology as ICT technology is an important 21st-century skill in the preschool curriculum.

Keywords: Technology, Preschool, Qualitative Study, Challenges, Hybrid Lessons, Generation Alpha.

1.0: INTRODUCTION

The first generation of children who were born in the era of portable digital devices which is the same year as the first iPad was released is known as Generation Alpha (McCordle & Fell, 2022). Generation Alpha has been categorized as those who were born from the year 2010 up until the year 2024 (McCordle & Fell, 2022). In Malaysia, the implementation of technology has been one of the initiatives in transforming learning towards 21st-century learning.

There are a few types of digital technology implemented in preschool settings. The devices that are commonly exposed to children are smartphones, tablets or iPads, podcasts, iPods, computers, and television. The statement supported by the study revealed that tablets, smartphones, and computers are the most commonly used gadgets in teaching and learning (Dore & Dynia, 2020). Research studies illustrate the importance of the integration of technology in teaching such as the enhancement of languages, social-emotional and communication skills of young children (Tran, 2021). The Malaysia Education Blueprint proposed eleven shifts to transform the system where one of the aims is to strengthen Information and Communications Technology (ICT) as the initiation to boost the quality of learning across Malaysia (MOE, 2013). The role of technology should not be neglected because it can be the medium to ensure digital literacy can be exposed to students. It can be a change of study mode which replaces the exam-oriented study method (Abu Bakar, Amat, & Mahmud, 2019). The use of technology has been emphasised as one of the value-added elements listed in Elements Across the Curriculum (MOE, 2017). NPSC believes that the efficiency and effectiveness of teaching can be improvised through the use of technology (MOE, 2017). However, a study shows that less than 50% of teachers conduct teaching using ICT tools (Jemimah & Suziyani, 2019).

The preschool curriculum was revised and is officially known as the National Preschool Standard-Based Curriculum (NPSC) (MOE, 2017). One of the new aspects of this curriculum is 21st-century learning skills to stimulate structured and focused thinking pupils which leads to Higher Order Thinking Skills (MOE, 2017). Based on the study on the motivations and challenges in the use of ICT, it shows that the convenience of ICT tools in the classroom plays an important role in motivating a teacher in using ICT tools in the teaching and learning process (Puspawati & Juharoh, 2021). Thus, this study needs to explore the teachers' perception of implementing technology in preschool settings to identify the pros and cons of using technology in the preschool curriculum.

The main purpose of this study was to explore the perceptions of preschool teachers on the implementation of technology in the preschool curriculum. In addition, this study also aimed to identify the experiences of preschool teachers in using technology for online hybrid and physical face-to-face lessons. Furthermore, this study also strives to identify the issues in implementing technology in the preschool curriculum. Apart from this, ways to make improvements in implementing technology in the preschool curriculum are also investigated. Implementing technology in the early childhood environment can sometimes lead to the use of inappropriate technology. It is essential to ensure that technology and interactive media tools are used appropriately and purposefully. Educators who are aware of theories and practices that are related to child development and those who are technologically savvy possess the ability to incorporate the appropriate use of technology effectively in lessons. To ensure that technology is implemented appropriately in the classroom, educators require constructive paradigms and useful principles to foster an enriching learning environment for children (Technology & Young Children Interest Forum, 2008).

1.1 Problem Statement

The Covid-19 pandemic affected the education system in Malaysia including the preschool curriculum (Senin & Halim, 2021). The Movement Control Order (MCO) in Malaysia restricted the people's movement and the preschool curriculum's mode was transformed into online learning (Senin & Halim, 2021). The MOE encouraged teachers to use online educational technologies such as Zoom, and Google Classroom to conduct online education (Kelvin Yew & Tan, 2020). However, teachers faced challenges in accessing the technology facilities and online resources. The study revealed that the most important factor that affected the use of technology was the inconvenience or lack of facilities, support and learning resources (Kelvin Yew & Tan, 2020). Thus, it exposed a necessity to study the current practices of preschool teachers in using digital technology.

In addition, the lack of real-life practice in using technology in the preschool curriculum. A study conducted in Malaysia revealed that some teachers lack the confidence to use ICT during the lesson as well as their lack of knowledge in ICT to implement technology in teaching lessons (Jemimah & Suziyani, 2019). This study result showed that teachers have accepted the evolution of education by integrating technology into the preschool curriculum, but need to find ways to solve the issues of implementing technology in teaching due to their lack of professional training in ICT.

1.2 Research Questions

This study aimed to answer the following questions:

1. What are the perceptions of preschool teachers in using technology to teach?
2. What are the current practices of preschool teachers in using technology?
3. What are the challenges faced by preschool teachers in using technology to teach?
4. What improvements can be used to overcome the challenges faced when implementing technology in teaching pre-schoolers?

1.3 Significance of the Study

A revolution of learning is needed to ensure the learner is enabled to acquire technology and technical skills in the 21st century era. This study is being conducted on preschool teachers to investigate the implementation of technology in preschool. Secondly, it is vital to have clear outlines of the integration of technology throughout the transition of education from before the Covid-19 pandemic, during and after the pandemic, and during the endemic situation. Teachers need to enhance their ICT skills and hunt for online resources for online teaching (Kelvin Yew, & Tan, 2020). Throughout the study, the challenges are visible and discussed. Improvements for the implementation of technology in the preschool curriculum are then formulated.

2.0: LITERATURE REVIEW

The nature of teaching is changing. The changes in the preschool curriculum are to improve the current education which is adaptable to the current era. According to Lee (2021), the role of ICT is not to replace individual communication but act as the medium to facilitate the development of children such as early literacy skills.

2.1 Evolution of preschool education

Before the pandemic, the preschool setting was equipped with various materials for children to explore and engaged actively (Fox-Turnbull, 2019). However, the transition of

preschool education began in March 2020 when teachers were expected to begin online teaching and learning for preschool (Catalano, Torff, & Anderson, 2021). The evolution of preschool education existed in Malaysia as well. School closures were mandatory for all levels from preschool to schools and Universities during the Covid-19 pandemic (Lim, Ali, Malik, & Malek, 2021). Teachers were expected to conduct quality teaching using the online platform (Lim, Ali, Malik, & Malek, 2021). On 1st April 2022, Malaysia officially announced making the transition from the pandemic to the endemic stage (Khor & Ginsky, 2022). Thus, there is a need for children, parents, teachers, management of the school and stakeholders to collaborate in adapting to the evolution of the preschool curriculum.

2.2 Teacher's perceptions of using technology in Preschool

In a western study, findings revealed that the integration of technology in the early years is highly affected by the view of teachers (Batrakova, Ushanov, & Ioseliani, 2021). Several issues may lead to a negative perception of the implementation of technology in teaching such as the traditional concepts of teachers, insufficient ICT information, low confidence level, and lack of support such as facilities and funding (Anisimova, 2020). The acceptance of technology is also determined by the belief of teachers on the value of technology (Zaiti Zainal & Zaidah Zainuddin, 2020). The finding reveals that the majority of preschool teachers (80%) feel easy to use technology gadgets in teaching practices with the support of equipment provided in the school environment (Kamaruddin, Che Abdullah, & Idris, 2021). On the other hand, the usage of technology as the teaching material also supports the learning of students through expanding new vocabulary and generating new ideas for group discussion (Dore & Dynia, 2020). Apart from this, during the Covid-19 pandemic, technology plays the main role in education (Monteiro, Fernandes, & Rocha, 2022). However, misconduct of learning using technology may lead to problems such as being unable to concentrate during the lesson (Erişti & Avci, 2021).

2.3 Challenges faced in implementing technology

Some issues arise when implementing technology in the preschool curriculum. The barriers identified were of a few categories such as the limited opportunities for training, technical support, and the inadequate technology infrastructure of schools as well as the school policies (Zaiti Zainal & Zaidah Zainuddin, 2020). The problems that arise in the study of Kamaruddin, Che Abdullah, & Idris (2021) also mentioned the lack of technical support, time constraint, and lack of ICT skills. Preschool teachers are facing the problem of finding ways to make use of technology (Kamaruddin, Che Abdullah, & Idris, 2021). Fraser (2020) who conducted a study on teachers' perceptions of technology leadership in the classroom also revealed that issues such as poor funding, the low confidence level of teachers, poor administrative support and limited training caused a low rate of technology integration in classroom practices. The study from Lee (2021) also supported that the usage of technology in Malaysian schools is very low (5%). Three major issues can be concluded which are lack of information, lack of support and lack of real-life practices.

3.0 : RESEARCH METHODOLOGY

3.1 Research design

Qualitative research can be defined as the process of investigating the issues or topics which focused on the study by approaching the targeted study area and communities (Watts, 2021). Qualitative research provides wider views of research data in the dimension of qualitative

which deviated from quantitative research (Aspers & Corte, 2019). Thus, qualitative research has been chosen to investigate further trustable and reliable data through in-depth interviews (Pell, 2019). Apart from this, qualitative research also provides an in-depth study to explore and investigate the targeted situation through interviews and observations (Rashid et al., 2019). A case study has been implemented in this study to provide the opportunity for the researcher to conduct and investigate the study which gets closer to the real-life context of the society according to the targeted study area and participants (Rashid et al., 2019).

According to Erişti & Avcı (2021), qualitative research enables researchers to define the meaning of life and interpret it in the mode of qualitative. Qualitative research provides in-depth study to explore and investigate the targeted situation through interviews and observations (Rashid et al., 2019). Thus, a qualitative research method has been selected in this study using interviews and observations to study preschool teachers' perceptions and experiences in implementing technology in the preschool curriculum. On the other hand, the study revealed that a case study was commonly used in the study of technology in education (ÇETİN & ÖZDEMİR, 2021).

3.2 Research site, sampling technique and participants

The area of the study is a preschool located in the urban Klang area, Selangor, Malaysia. The selected preschool is a private preschool that has been established for more than 10 years under a well-known school system. Furthermore, this preschool system has emphasised targeted milestones to be achieved which is the Enhance Learning Environment (ELE) classroom. ELE classroom is the setting that implemented technology in the teaching and learning process. The researcher selected the qualitative research through a purposive sampling method. The purposive sampling method can be defined as non-random sampling where the selection of respondents is based on the characteristic of the population and the focus of the study (Crossman, 2020). The heterogeneity of participants are based on the teaching age group and teaching experiences in the preschool whereas the management of schools are selected based on the position of the job. Based on the purposive sampling method implemented in this study, a total of 8 participants from the study area who met the criteria of this study have been selected.

Table 3.1: Summary of demographic information of selected participants

Participants	Age	Workplace	Job Position	Experiences (years)	Highest Academic Qualification
P1	32	Preschool A	4 years old class teacher	15	Diploma in ECE
P2	26	Preschool A	4 years old class teacher	4	Bachelor's Degree in ECE
P3	32	Preschool A	5 years old class teacher	10	Bachelor's Degree in ECE
P4	43	Preschool A	5 years old class teacher	5	Diploma in ECE
P5	52	Preschool A	6 years old class teacher	30	Diploma in ECE
P6	45	Preschool A	6 years old class teacher	26	Diploma in ECE
P7	38	Preschool A	Head of School	20	Diploma in ECE
P8	26	Preschool A	Administrator	1	Bachelor's Degree in HR

3.3 Instruments

An instrument is a tool to interpret and present a greater understanding of the specific situation in the targeted study area (Creswell, 2014). Research instruments to be employed

in the study were interviews and observations to identify the preschool teachers' perceptions and experiences in the implementation of technology in the preschool curriculum.

3.3.1 Interviews

The purpose of conducting an interview is to gain the opinion of the interviewees and interpret the ideas delivered by the interviewee (Alamri, 2019). The interviews enabled the researcher to obtain the data through an in-depth discussion of the interviewee's experiences on the topic (Pell, 2019). Based on the setting of this research study, the researcher decided to choose a semi-structured interview as the instrument to collect data from the selected participants. The semi-structured interview involved the key questions to identify the data required for the research questions (Alamri, 2019). There are two different sets of interview questions that have been set to collect the data based on the research questions. The first set of interview questions was set for the selected participants from P1 to P6. The second set of interview questions was set for the selected participants for P7 and P8. The interview questions consist of two parts. Part one related to the participants' which demographic information and part two consisted of four research questions to elicit the participants' perspectives on the listed research questions.

3.3.2 Observations

Three observations that have been conducted used the observation field notes to triangulate the data collected through the interviews. The structured observations enabled the researcher to focus on the specific criteria that are required for the research study rather than recording everything that happens (Smit & Onwuegbuzie, 2018). The first part was to record the date, subject, age group to be observed, time, teacher in charge, the number of students involved, and teaching materials used in the classrooms. The second part focused on six questions for the observation. The first question focused on the digital tools implemented by the teachers during classroom practices. The second question is to observe the real-life practice of using technology in the classrooms. The third question focused on the way the children were engaged in learning using technology. The fourth question was to observe the length of time the children were exposed to the digital tools. The fifth question was to identify the current issues during the real-life practices of using technology. The last question is to observe the way teachers overcome the issue of using technology.

3.4 Data collection and analysis procedures

The study of a preschool with the implementation of technology in the curriculum has been conducted using triangulate method. This is to enable the researcher to identify preschool teachers using technology from different resources which are observations, teachers' interviews, and the school management team's interviews. Thus, a qualitative research method has been selected in this study using interviews and observations to study preschool teachers' implementation of technology in the preschool curriculum.

The triangulation method enables the researcher to identify preschool teachers using technology from different resources such as observations, teachers' interviews and the management team school's interviews. The triangulation method had been selected to ensure the data collected was valid and reliable. Triangulation can be explained as the mixture of different methods and theoretical perceptions in dealing with a circumstance (Alamri, 2019). According to Alamri (2019), the combination of different instruments enables to validation of the data collected throughout the research. Thus, the validity of the research

can be increased by using two or more instruments to explore the studied topic (Alamri, 2019). On the other hand, the reliability of the data collected can be supported by the observations (Kiger & Varpio, 2020). Observation is a fact that occurred in real-life practice in school (Kiger & Varpio, 2020). An interview is the subjective perceptions of the selected participants based on their experiences in the preschool setting (Watts, 2021). Thus, interviews and observations have been selected in this study.

The two-method triangulation which is also known as the methodological triangulation method was applied in this study by collecting data from interviews and observations to avoid bias during the process of collecting and analysing the data. Consent letters for selected schools and participants were distributed and signed by the Head of School and selected participants. The interviews had been videotaped and the conversations were transcribed into written form. Three observations were recorded in the form of observation field notes for the data related to the research questions. The important incidents in the observations were recorded in the form of field notes as evidence to support the findings.

The data collected from interviews were transcribed into text data. Thematic analysis has been selected to describe the data through interpreting the transcribed written data, forming the code from the data, searching for the themes, naming the themes and lastly presenting the data (Kiger, M & Varpio, L, 2020). Then, the qualitative data analysis software of ATLAS.ti 9 has been selected as the tool to code the interview data and followed by the data gained from the observations. This method is known as the triangulation method which supports the reliability of the findings collected from interviews. The data collected from observations triangulated the results revealed from interviews. The researcher compares and combines similar codes from both the interviews and observation data.

4.0: RESULTS

The results of the preschool teachers' perceptions and experiences in the implementation of technology in the preschool curriculum have been analysed using ATLAS.ti 9. The data have been coded and exported in the form of a table using the thematic analysis.

4.1 Teachers' perceptions of teaching using technology in Preschool

The findings revealed that the highest frequency of technology tools used among teachers is the laptop from 6 participants during the interview. P1, P2, P4, P5, P6 and P8 stated laptops as one of the tools to implement technology in the preschool curriculum. All selected participants (8) agreed that the implementation of technology is crucial in the preschool curriculum. The advantage of using technology is to make learning a fun and enjoyable process whereas the misuse of technology and health issues are the disadvantages of using technology in teaching.

4.2 Practices of preschool teachers in using technology

Table 4.1 Current practices of preschool teachers in using technology

Participant	Current practices of preschool teachers in using technology
P1	Yes, I love to use that but not all the time
P1	I will choose which subject I need to use a laptop and how I'm going to teach them
P1	technology yes, but not too much technology for preschool children, I mean, if you want to do it for the whole lesson with preschool children, I don't think so will work because they are very young children and they cannot sit for a long time
P2	Yes, I implement, but not every time I just use my laptop to show the song show as the sound of the phonic
P3	Technology is important but it's not every day
P4	Yes, I do. I use the laptop
P4	I use it more in the KUW lesson
P5	we have the smartboard. Projector and also we use a laptop in the class
P6	I do implement technology in my teaching. But not all the time
P7	Yes, but not to say 100% fully on ICT

Table 4.1 presented the current practices of preschool teachers in using technology as mentioned by selected participants. Results can be concluded that technology is applicable in the preschool curriculum for specific subjects and specific periods but not all the time.

Table 4.2: Transition of preschool teachers in using technology

Before the pandemic	During the pandemic	Endemic
Very limited usage Not applicable	Fully online Hybrid class	Using technology for certain subjects

The transition of preschool teachers in using technology has been illustrated in Table 4.2. There is minimal usage or no applicable technology before the pandemic. During the pandemic, technology has been fully implemented due to the online and hybrid classes whereas, during the endemic, the technology is still implemented for certain subjects. This analysis is supported by the data collected from observation field notes. The observation was conducted during the endemic. OB1 showed that the teacher used a laptop and YouTube to show visual animation of the butterfly life cycle and conduct storytelling. In OB2, the teacher implemented technology by using a laptop for rote counting activities. In OB3, technology was implemented during the KUW lesson. Children fully engaged in the lesson through the smartboard and smart pen.

Table 4.3: Summary of respondents' experiences in the implementation of technology

Online lesson	Hybrid lesson	Physical lesson
Fully implement technology -YouTube -Zoom -PowerPoint slides	Certain children in the classroom, certain children online -Google Meet	Certain subjects implement technology -computer class -interactive software -KUW subject

Table 4.3 summarised the teachers' experiences throughout the three different learning modes which are online, hybrid and physical lessons. An online lesson is fully implemented technology by using platforms such as YouTube and Zoom as well as sharing PowerPoint slides. A hybrid lesson is where certain children are in the classroom and certain children will study online using the Google Meet platform as practised in the selected study area. Physical lessons conduct certain lessons using technology such as the computer class and KUW subjects using interactive software.

4.3 Challenges when implementing technology in teaching in Preschool

Table 4.4 Challenges when implementing technology in teaching

Participant	Challenges when implementing technology in teaching
P1	Lack of professional training
P1	I think is poor network
P1	there are no systems in place to utilize technology in the curriculum
P2	the line is not really good
P2	some of the class got the LCD projectors, and some of the class does not have. So it's hard, and it's a little bit challenging for teachers
P3	We need to scream. Scream and teach to other children because the hybrid lesson students need to understand using the laptop
P3	problems like Zoom, all is very new for us
P3	if the company never pay for the Zoom, 40 minutes we need to log out
P4	our Internet is not stable
P4	I feel like the children at home are being neglected in the hybrid lesson because we have to give importance to the physical children who are here
P4	there's only one smartboard
P5	have to sacrifice overtime to allocate time to set up the lesson
P6	Wi-fi problem
P6	For me, like a first timer using Zoom, you know. "I'll get panic very fast and I'll get stressed
P6	they will say, "teacher, I cannot see the board and then it's too small, I cannot hear." Then, I have to focus on two places to go front of the laptop, tell them what to do and then I have to look at the children also. So it's like a bit very difficult when it comes to hybrid.
P7	There are not enough resources, especially the budget. We need to probably put in more budget, purchasing more gadgets
P7	There's always this technical problem that many of us are not professionals in technologies
P8	We have senior teachers who have problems with it

The highlighted issue mentioned by the four selected participants is the poor network connection. The following issues were from three participants who claimed that hybrid lesson is not effective for teaching in the preschool curriculum and insufficient ICT skills of the preschool teachers. The other issues mentioned by the participants are the lack of a system, equipment, training, funding issues, and time constraints.

The overview of the sub-question showed that 4 participants faced issues when transitioning from online teaching to physical teaching whereas 4 participants claimed that there is no issue with transitioning from online teaching to physical teaching. P2 stated that *“from the online to the physical, children can adapt to the school, the classroom and their friends”*. On the other hand, P3, P4, P5 and P6 claimed that children had problems with basic academic skills, lack of interaction and forgot their daily routines. P6 stated that *“When they came back for physical teaching, they don’t know what to do. All this while, they have been sitting in front of the laptop all the time. They’ll like to forget all the timetable and everything”*.

4.4 Ways to overcome challenges in implementing technology in Preschool

There are a total of 5 participants who suggested providing professional training for preschool teachers. P1, P4, P5, P7 and P8 stated that the teachers should be given proper professional training in technology. It is also crucial to provide ICT tools as mentioned by P2, P3, P4 and P7. P3 stated that *“Please implement it in all the schools with more technology”*. Next, the suggested way to overcome the issue is to provide a stable network connection which is stated by P2, P4 and P6. P2 mentioned that *“The school needs to make sure the Internet line is good”*. The following suggested way is to provide more software which is stated by P3, P7 and P8. P7 claimed that *“buying more software or exposure that we need like that is good for the children”*. Last but not least, financial support from the management of schools has been suggested by P7 to overcome the issues faced in the implementation of technology in the preschool curriculum.

P1 claimed that there is no issue shared the view of *“I think there was no issue for me, but at the same time, it was a very good experience for me”*. P2 stated that *“some of the children will come in crying, so I explained to them..... It takes time, but by every day the teacher explained it helps them and when they already adapt to the environment, they become better”*. P4 suggested one-to-one coaching for children who lack writing as well as keeping in touch with parents using Class Dojo. P5 also suggested teaching individually and then in the group for children to adapt and improve their social skills. P6 suggested repeating the daily routine for the children. P7 suggested that teachers’ training and meeting are crucial for improvising the issues. Lastly, P8 claimed that teachers should accommodate it where the management of the school supports the teachers.

5.0: DISCUSSION

This study focused on the perceptions of preschool teachers on the implementation of technology in the preschool curriculum. The experiences of preschool teachers in the implementation of technology in the preschool curriculum have been revealed in this study. Furthermore, the issues that are faced by preschool teachers on teaching using technology have been identified and suggestions have been made by the selected participants.

5.1 Summary of major Findings

5.1.1 Teachers' perceptions of teaching using technology in Preschool

Research question one revealed that the most common technology tool in this study was the laptop which was mentioned by 6 participants. These findings aligned with the study by Konca & Tantekin Erden (2021) who defined ICT tools as gadgets such as computers and smartboards. All selected participants acknowledged the importance of technology in the preschool curriculum and the belief that technology is crucial for young children. P1 stated that *"technology makes learning an enjoyable process"* (P1, L31-31).

This can be supported by Yang, Oh, & Wang (2020) who claimed that technology is the factor which influenced teaching in this current era. The study presented fun learning and engagement of children were the advantages of using technology in teaching. On the contrary, misuse of technology and health issues are the disadvantages exposed by preschool teachers. P7 stated that if preschool teachers or parents are not careful, they could expose the kids to the wrong exposure (P7, L56-59). The finding can be related to the study by Pell (2019) who claimed that technology is not all beneficial and not all harmful to humans.

5.1.2 Practices of preschool teachers in using technology in Preschool

Research question two revealed the current practices of preschool teachers in using technology. The findings showed that all participants used technology in their current teaching, however, it's only applicable for certain subjects and periods. Table 4.2 presented the evolution of preschool teachers in using technology. It reflected that before the pandemic, there was very limited usage or even not applicable for the selected participants to teach in preschool. During the pandemic, technology has been fully implemented for online and hybrid lessons. During the endemic, preschool teachers in the selected study area used technology for certain subjects. Thus, preschool teachers of the selected study area were using technology according to the evolution of preschool education in Malaysia.

5.1.3 Challenges when implementing technology in teaching in Preschool

Research question three examined the issues when implementing technology in teaching that has been categorized into 8 sub-themes. The result revealed that poor network connection was the most common issue faced by the selected participants and was followed by the ineffectiveness of hybrid lessons and insufficient ICT skills as presented in Table 4.3. Furthermore, the lack of ICT skills also is a barrier for preschool teachers to implement technology in the preschool curriculum. According to P3, P6 and P8, Zoom is very new for the senior teachers in the preschool.

This finding can be related to a study that revealed teachers with more experience have lower knowledge of ICT skills (Dore & Dynia, 2020). However, there are only four participants who faced issues when transitioning from online teaching to physical teaching whereas four participants have no issues and claimed that the transition from online teaching to physical was adaptable by all the children. P5 who is 6 years old class teacher claimed that during the online lesson, children faced, indirectly caused issues when transitioning from online to physical lessons (P5, L83-89). Therefore, there are issues faced by preschool teachers who are teaching 5 and 6 years who need to accommodate the transition and maintain the quality of teaching using technology.

5.1.4 Ways to overcome challenges in implementing technology in Preschool

Research question four has been analysed to reveal the ways to overcome the challenges faced in implementing technology. There is a total of 5 participants who suggested providing professional training to solve the issues faced by teachers. On the other hand, one-to-one coaching is the solution to help children to adapt to the transition from online to physical classes. Management of the school also plays an important role to support teachers to accommodate the transition of preschool teaching.

The finding can be supported by the reviewed literature which revealed that teachers have very limited time to transform teaching into online settings during the outbreak of the Covid-19 pandemic (Yavari, 2021). Thus, the management must invest in the modification of teaching using technology.

5.2 Discussion

The data have been analysed based on the four research questions which are challenges faced by preschool teachers on teaching using technology, practices of teaching using technology based on the transition of preschool education, and the general implementation of technology. The demographic information of the selected participant has been studied to identify the relationship between the background of teachers and the implementation of technology. The study revealed that selected participants who have more experience known as senior teachers with above 25 years of teaching experience were struggling to use technology during the pandemic. It can be revealed from the statement from P8 *"we have few young teachers who can cope well.....we have the senior teachers who have problems with it"* (P8, L:55-57). However, there are no significant results that show the educational background of selected participants affected the use of technology.

All of the selected participants acknowledged the importance of technology in the preschool curriculum and belief that technology is crucial for young children. It can be supported by the findings from table 4.1 where all participants agreed on the usage of technology in teaching. Research question two showed that all of the participants used technology in their current teaching, however, it's only applicable for certain subjects and periods. The finding is supported by P3 who stated that *"technology is important but it's not every day"* (P3, L26-26). Research question three revealed that poor network connection was the most common issue faced by the selected participants. This statement can be supported by P4 who claimed that the internet is not stable in school (P4: L69-69). Ng & Yunus (2021) also mentioned that unstable internet access is an issue of integrating technology into the preschool curriculum. Research question four revealed that training is one of the methods to solve the challenges faced by teachers. P4 stated that *"I think we need to have yearly ICT skill training for teachers"* (P4, L85-86). This can be reflected in the study by Fox-Turnbull(2019) claimed that there is a need to provide guidelines for teachers to adopt technology in the preschool curriculum.

Research question two aimed to study the current practices of preschool teachers in using technology. There is a process for preschool teachers in adapting and implementing the use of technology in teaching. Based on the study, the usage of technology is very limited before the pandemic. As there is only one participant shared that the school used a smartboard for teaching. P6 claimed that technology is not applicable at all before the pandemic (P6, 52-52). This finding revealed that before the pandemic, there is very limited exposure of the technology to preschool teachers as well as children. During the pandemic, technology has been fully implemented by all the selected participants. P4 stated that *"during*

the pandemic, everybody was at home and where only the gadgets help" (P4, L26-27). This is tallied with the finding from Monteiro, Fernandes, & Rocha (2022) where technology plays the main role in education during the Covid-19 pandemic. During the hybrid lesson, P5 stated that *"one or two children will be with us and the rest of them will be online"* (P5, L64-65). It aligned with the study which defines hybrid lessons as the mode of learning where certain children attend virtually using the Internet for distance learning whereas certain children attend physical school (Konerman, R., Horwitz, J., Clancy, S., & Rietta, C., 2022). The implementation of technology has been gradually implemented in the physical lesson after the pandemic where preschool teachers were familiar with the technology during the pandemic. During the endemic, findings shows that the implementation of technology gradually increased in teaching. P6 stated that *" after I got exposed to these IT gadgets.....using and know how to use the laptop..... how to use the smartboard"* (P6, L58-60). The statement reflects the transition of preschool teachers in using technology. It was notable that after the exposure to technology during the pandemic, preschool teachers experienced the usage of technology and were willing to implement it even in a physical class.

Evolution can be defined as the gradual change of a process whereas the transition is the changes from one form to another form (Collins, 2022). The study revealed that education has evolved in terms of ways of teaching and the use of educational tools (Chen, Muthukumarana, Chalhoub, & Chen, 2022). According to P6, technology is the device to explore their world of knowledge and fulfil their curiosity (P6: L26-28). This finding can be linked with the traits of Generation Alpha who are unable to be apart from technology in their daily life (Dalim et al., 2019). Notably, the evolution of preschool education in this current era has changed based on Generation Alpha. Preschool teachers had gradually adapted to the changes in teaching-learning using technology even during the endemic.

5.3 Recommendations for further research

Based on the findings, the researcher recommended that there is a need to study in-depth the preschool teachers' perceptions and experiences in the implementation of technology in the preschool curriculum. It was undeniable that the Covid-19 outbreak forced preschool teachers to bring technology into the classroom setting (Watts, 2021). Thus, it is necessary to conduct further research to fully investigate and explore the impact of Covid-19 on children after the transition from online learning to physical learning. It is also crucial to conduct a repeated measure design study to collect the data from different regions in Malaysia. Furthermore, the researcher also suggests collecting data from a wider range of respondents from different preschools to increase the reliability and validity of the study's results. As a result, there is a need to conduct further research on the implementation of technology to accommodate the learning of Generation Beta which come after Generation Alpha in the year 2025.

5.3 Conclusion

Overall, this study studied the teachers' challenges in implementing technology in the preschool curriculum. All of the selected participants have concepts of implementation of technology in the preschool curriculum. Laptops are the most common technology tool applied in the selected study area. All of the selected participants agreed that the implementation of technology is crucial for Generation Alpha. However, the misuse of technology and excessive screen time might be a negative impact on using technology. Thus, preschool teachers were advised to implement the technology by selecting appropriate

content and controlling the screen time of using technology in the teaching and learning process.

On the other hand, preschool teachers had gone through the transition of preschool education using different learning modes which are online, hybrid and physical learning. Selected participants claimed that before the pandemic, technology is very limited and may be restricted for a certain school. During the pandemic, technology is compulsory and is the only tool to conduct online or hybrid learning. After the pandemic, preschool teachers adapted and implemented technology in physical learning but only applicable for certain subjects and is time-controlled to avoid excessive screen time for children. Apart from this, this study also revealed the issues faced by preschool teachers regarding the implementation of technology in the preschool curriculum. The issues are a poor internet connection, ineffective hybrid lesson, insufficient ICT skills, funding issues, no system, lack of professional training and time constraints. Next, the management of schools and 4 years old class teachers claimed that children can adapt well when transitioning from online teaching to physical, however, 5 and 6 years old children have difficulty accommodating the learning and routine in physical learning after the long term of online learning.

Thus, there are ways to encounter the problem of the implementation of technology that provides professional training skills, providing sufficient ICT tools, provide stable network connections and support from the management of the school. Lastly, selected participants in this study suggested that to provide one-to-one teaching for children who faced issues when transitioning from online to physical learning. Furthermore, the management of the school must support teachers in accommodating the transition of different learning modes. These findings are crucial for preschool teachers and parents to understand the appropriate and fun learning for children using technology. It is also crucial for the management of the school to support the needs of preschool teachers and provide the most suitable learning environment for children in different learning modes. Government should also take action to provide a proper system and guidelines to improvise the implementation of technology in the preschool curriculum.

To sum up, hands-on activities are still the dominant learning for children to experience, explore and encounter their world of knowledge whereas technology is to enrich learning into a more enjoyable process.

5.4 Theoretical and Contextual Contribution

Social constructivists proposed the idea of being student-centred (Morchid, 2020). According to Morchid (2020), technology in education maximizes the participation of students in the learning process. Thus, these findings have reflected that the concept of technology-based learning is necessary in the preschool curriculum with the support of social constructivists. Furthermore, Piaget viewed learning occurs as the learner interacts with the environment (Erbil, 2020). It is undeniable that Generation Alpha are unable to be apart from technology in their daily life. Therefore, these findings are crucial for preschool teachers to implement appropriate teaching approaches using technology. Moreover, this study leads to the conclusion that technology is applicable to different learning modes which are online, hybrid and physical learning. Thus, these findings provide a guideline for teachers, parents and management of the school to improve the learning experience of preschoolers by accommodating the era of technology.

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