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Assessment of Early Childhood Education Teachers' Attitude, Knowledge, and Application of Information Technology (Ict) in Teaching in Benin Metropolis

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Abstract

The study titled "Assessment of Early Childhood Education Teachers' Attitude, Knowledge, and Application of Information Technology (ICT) in Teaching in Benin Metropolis" aimed to investigate the attitude, knowledge, and application of Information and Communication Technology (ICT) by early childhood education teachers in Benin Metropolis. The study used a descriptive survey method and included all preschool teachers in public and private schools in Benin Metropolis as the population. A sample size of 560 teachers was randomly selected from the pre-schools and a questionnaire adapted from Agboola (2016) was used as the instrument for data collection. The questionnaire was validated by three experts in measurement and evaluation and two other experts in ICT. The Cronbach alpha reliability statistics was used to ascertain the reliability of the instrument for the three sections. It gave the values as 0.91, 0.86 and 0.92. Research questions one to three were analyzed using mean and standard deviation, with a benchmark set at 2.50 for acceptance, while multiple regression analysis was used to answer research question four at 0.05 level of significance. The study found that the attitude of pre-primary school teachers towards ICT in Benin Metropolis was positive, knowledge and application of ICT was moderate, and the sex, age, and experience of preschool teachers significantly predict their attitude, knowledge and application of ICT in teaching. The study recommended that seminars and workshops be organized for preschool teachers on the application of ICT in the learning and teaching of children.

Introduction

Innovations and techniques to improve the teaching and learning situation have been sought after globally, including Nigeria. One such innovation is the use of Information and Communication Technology (ICT), which has the potential to support learning, construct knowledge socially, and develop autonomous learning skills and competencies (Verhoeven, Heerwegh & Dewit, 2010). The usage of ICT has surged worldwide and has impacted the lifestyle and nature of those who apply it, leading to job creation in various fields (Alazam et al., 2013). The educational system has also been greatly impacted by ICT, improving the teaching-learning process at all levels. According to Bhat and Beri (2016), ICT has helped teachers handle various contemporary challenges such as quality, access, flexibility, and high dropout rates.

Bakare (2016) defines ICT as the strategy or technology used to structure information and communication. The use of technology and technological tools can further enhance the productivity of both learners and teachers by making information available (Al-zaidiyee et al., 2010). ICT refers to technologies that provide access to information through telecommunications, including the internet, wireless devices, computers, and more. These technologies are being adapted to different functions and fields to make work easier and less time-consuming for most people. Education is also not left out as ICT has proven to be a useful gadget in ensuring pupils get the right knowledge and making learning easier for them. It is important to note if early childhood education teachers have the right knowledge of these gadgets and have a proper understanding of how to use ICT then they will be able to pique the interest of their learners and increase their level of understanding. The knowledge of the teacher in the area of ICT is becoming a vital part of the school curriculum, especially since pupils are taught subjects like computer studies and elementary science, which include computers and the internet. If teachers are not knowledgeable in these areas, pupils may not be taught effectively.

Early childhood education refers to all forms of education, both formal and informal, given to children who are less than or equal to eight years old. This type of education is crucial to the development of the child and helps to shape their future in later years. The programs are specially designed for children at different stages of their lives and can be received in different settings, including daycare, preschool, nursery, kindergarten, and more. Some of these programs are run by both private and government establishments. In Nigeria, early childhood education (ECE) or preschool education is for children between zero and 5 years old before they embark on normal school. Early childhood education goes beyond providing care. It involves picking and engaging in actual educational experiences and activities.

The National Policy on Education (2014) specifies the various components that should be part of an early childhood education curriculum. These include providing a well-rounded

curriculum that supports all areas of development, addressing nutrition, child health, and family needs as part of its comprehensive work, assessing children to enhance their learning and identify concerns, ensuring teachers are adequately trained, professional, and well-paid, and keeping class size small and teacher-pupil ratio low to encourage the participation of every child. These components are vital for the early childhood education process to be successful. A strong foundation for language classes and mathematics and developing good interpersonal relationships with others should also not be overlooked. Advancements in technology have impacted all sectors, including education, where individuals use ICT tools at work, schools, and even at home. Lives (Pavlovic et al., 2016). Therefore, it is crucial to introduce children to the world of digital technologies as soon as possible. In this context, preschool teachers who handle these children should actively use these tools in their work.

Attitude is a stable set of predispositions of certain opinions, purposes, and interests, including the expectation of a particular kind of experience and readiness for a right response. Karel-Kareijns et al. cited in Agboola (2016) define attitude as a person's good or bad evaluation, feeling, and tendency towards a thing or idea. Attitude has three components: cognitive, affective, and behavioural. The cognitive component is made up of the person's system of beliefs or perceptions about the object in question, mainly about their values, not what they know or have heard from others. The affective component is the emotional part of the attitude that often plays a major role in the decision-making process and resists the most change. It shows how deep-rooted and intense the individual is in their assessment of the object. The behavioural component shows the likelihood to react towards the object or subject of the attitude in certain ways, which is usually through observation and reaction of the individual involved. These three components do not work in isolation, rather they form connections. A change in one is likely to cause a change in others to maintain consistency in the internal structure of the attitude. These components can be at a simple or complex level depending on the strength and how exposed an individual is to the object.

Different authors have discussed the knowledge, attitude, and application of ICT by early childhood education teachers. International and national researchers have noted the importance of teachers developing ICT expertise (Dong, 2018); Blackwell et al., 2016; Johnson et al., 2020). Although the role that ICT plays in children's development is still debated, researchers have generally agreed that the current focus should be related to the question of how ICT should be used to maximize its benefits, rather than whether ICT affects Children's development (Blackwell et al., 2016; Bird, 2018). Ihmeideh and Al-Maadadi (2018) have emphasized that the responsibility of integrating ICT into ECE settings falls on the shoulders of teachers.

Therefore, the question of how children use ICT with the guidance and support of teachers is important for ECE settings. However, ample evidence shows that ECE teachers implement ICT for children inappropriately, such as by providing insufficient responsive guidance and limiting children's interaction with ICT (Dong, 2018; Sargent, 2017). Inappropriate ICT

implementation may cause children to have negative feelings and limited learning opportunities (Dong, 2018; Sargent, 2017), which may have a long-term effect on children's ICT-supported learning. The professional learning experience of early childhood education teachers regarding ICT-related curriculum is important since they are the ones who decide how children experience ICT in ECE settings.

Studies have shown that teacher training is the main factor influencing the practice of early childhood education teachers in relation to ICT competence (Blackwell et al.,2016); Sagent, 2017; Dadanou & Kofoed, 2019). For example, Dardanou and Kofoed (2019) reported that teachers in Norway lack knowledge about how to deal with ethical issues regarding ICT implementation due to the absence of relevant training. In Jordan, Ihmeideh cited in Yang and Hong (2022) reported that ECE teachers lack funding to participate in ICT-related training and, therefore, stick to old approaches to teaching. Similarly, in Greece, Nikopopoulou and Gialamas (2015) reported that ECE teachers had more training opportunities on the technical level than the pedagogical level and indicated that their previous training did not enhance their confidence in ICT implementation. In Nigeria, Eremina and Isom (2022) reported that preschool educators had a positive attitude with low utilization of ICT facilities, while Agboola (2016) observed that the attitude of Nigerian secondary school teachers towards ICT was high, but there was a significant difference in their attitude on using ICT as an educational tool based on age, education, gender, experience level, and subject taught .

In their study in Qatar, Ihmeideh and Al-Maadadi (2018) observed that teachers tended to experience a careful decision-making process when about to implement ICT in learning activities after the training. In Australia, Johnson et al. (2020) reported that the value of individual and collaborative group reflections and the significance of various professional learning resources, such as professional reading, group discussion, and workshops, were vital issues that also affect the use of ICT in schools. Mertala (2019) suggested that ECE teachers should have more training opportunities that go beyond the focus on using ICT for teaching curricular subjects. Furthermore, Sargent (2017) advocated that ongoing support could help teachers experience sustainable changes in knowledge and skills related to ICT implementation. Teachers' observation and reflection on ICT use are important parts of professional development because the process of observation reflects changes to practice and more reflection (Vidal-Hall et al., 2020), can result in the modification of view, and therefore a transformation in teaching practice, which finally influences children's learning experience. Teacher understanding of technologies is fundamental to their ICT implementation (Blackwell et al., 2016; Johnston et al., 2020). Some researchers have argued that teacher understanding of pedagogies is critical because it determines how teachers implement ICT in pedagogical activities (Nikoplopoulou & Gialamas, 2015; Mertala, 2019; Vida-hall et al., 2020). These different understandings of the foundation of ICT implementation have resulted in multiple foci about ICT-related professional development.

Despite teachers' positive belief towards using technology in teaching young children, teachers are less inclined to enact ICT in their lessons, play or classrooms, suggesting that there is less exposure to technology use in educating young children (Lauricella et al. 2015). Pavlovic, et al. (2016) observed that preschool teachers were aware of the insufficient use of ICT tools in the process of upbringing. Magen-Nagar and Firstater (2019) observed that implanting ICT in early childhood classrooms is limited by teachers' beliefs related to their didactical and pedagogical and children's developmental factors.

According to Ottestad, Kelentri, and Guomundsdottir (2014), undergraduate students in ECE in a university in Spain, with a focus on knowledge, use, and attitude towards ICT, did not exhibit the expected level of digital competence despite being 'digital natives. That is, even though they were born and raised in the digital era, which is mainly characterized by a high integration of ICT in their daily activities and where they do not perceive technology as hostile, since they use it quite skillfully in their everyday life. Fakeye (2010) showed that the use of computers by teachers to teach English language in private junior high schools in the city of Ibadan was low (2.5%), even though 95% agreed to use it to correct punctuation and spellings. Oladosun (2012) found out that contemporary teachers in Nigeria tend to be pessimistic in their perception and attitude toward change. Onasanya et al. (2011) stated that male teachers were more computer literate than their female counterparts but the male subjects failed in the area of communication. However, the level of utilization across each gender was low. Youssef et al. (2012) stated that there was a positive attitude from the teacher and there were signals of willingness to use ICT. Omoniyi and Quadri (2013) opined that the competence of teachers in the use of ICT was not affected by the teaching experience a teacher possesses, and there was low competence in the use of technology of ICT in teaching. Ifeoma et al. (2013) noted that there was a low level of awareness and use of ICT among economics teachers in Anambra State.

Parilah and Josclyn (2015) discovered that teachers possess a relatively average positive attitude towards the use of ICT tools, while Agboola (2016) revealed that the attitude of Nigerian secondary school teachers towards ICT was high, but there was a significant difference in their attitude toward using ICT as an educational tool based on age, education, gender, experience level, and subject taught.

Information and technology are things that should be incorporated into the learning and teaching process. Aside from helping the teacher to teach better, it also has advanced benefits for the children. Children born these days are digital natives, and as such, it already has an effect on them and on the environment and people that surround them. Also, ICT tools are becoming ubiquitous components of the physical and social world. It is an important part of the private work life of most people, including young children. In early childhood education, ICT can support and enhance learning and play experience, support and strengthen professional learning as an early childhood teacher, and support and strengthen the teacher's relationship with parents and other people connected to the early childhood education center. This has led

to many curricula supporting the integration of ICT across the education sector from early childhood to tertiary.

ICT is an important part of the learning and teaching process. However, measurement and usage of ICT at the basic level is still underdeveloped. Most of the instruments used in the field measure different components of ICT rather than basic orientation such as ICT usage, attitude towards ICT and training, ICT literacy, attitude and belief towards ICT, attitude towards computer, integration of ICT, and perception towards ICT (Oye et al, cited in Umar et al., 2018, Buabeng-Andoh, 2015, Edmunds et al. 2012, Bhat & Bashi, 2018, Mehra & Far, 2013, Beacham & McIntosh, 2014, and Aslan & Zhu 2016). These researches were conducted in the upper educational levels which has led to tremendous changes and affected the productivity of the teachers. However, not much has been done at the basic levels. It is against this backdrop that this study was carried out. In furtherance of this, the following questions were raised

1. What is the attitude of early childhood education teachers towards ICT?
2. How knowledgeable are early childhood education teachers in the area of ICT?
3. To what extent is ICT used by early childhood education teachers in pre-primary schools in the Benin metropolis?
4. Do sex, age, and years of experience predict early childhood education attitudes, knowledge and usage of ICT?

Methods

The study adopted a descriptive survey method, with the population consisting of all the preschool teachers in public and private schools in Benin Metropolis. A sample size of 560 teachers was randomly selected from the pre-schools, with 300 from private schools and 260 from public schools. 79.3% (444) were females while 20.7% (116) were males. 89.8% (503) of the teachers had 5 years and above of teaching experience and 10.2% (57) had below five years' experience. Based on age, 85.4% (478) were below 40 years, and 14.6% (82) were 40 years and above. The questionnaire was used as the instrument for data collection, adapted from Agboola (2016). It was in three parts (sections) A, B, C, and D. Section A contains the demographic details of the teachers, such as sex, age, ownership of school, and years of experience. Section B contains 15 items used to elicit information on the teachers' attitudes towards the use of ICT. Items in Sections C and D were used to elicit information on the teachers' knowledge and application of ICT, each containing 10 items. The modified 4-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD), as well as Always (A), Sometimes (S), Rarely (R), and Never (N) with a weight of 4, 3, 2, and 1 were used. The instrument was validated by three experts in measurement and evaluation as well as two experts in the field of ICT. The Cronbach alpha reliability statistics was used to ascertain the reliability of the instrument for each of the sections. It gave the values as 0.91, 0.86, and 0.92. Research questions one to three were analyzed using mean and standard

deviation, with a benchmark set at 2.50 for acceptance, while multiple regression analysis was used to answer research question four at 0.05 level of significance.

Results

Table 1: Attitude of Pre-school Teacher Towards the Use of ICT in Benin Metropolis, Edo State

Items	Mean	Standard deviation	Remarks
The computer would help me organize my work	3.00	0.70	Agree
Using a computer would make the subject matter more interesting	3.54	0.65	Agree
Computers save time and effort	2.70	0.78	Agree
Using a computer is enjoyable	3.56	0.72	Agree
Computers make me much more productive	3.74	0.65	Agree
Teaching with computers offers a real advantage	3.54	0.86	Agree
Computers have proved to be effective learning tools.	3.38	0.80	Agree
Computers would enhance students' learning	3.50	0.86	Agree
I would rather do things by hand than with a computer.	1.59	1.86	Disagree
Computers will improve education	3.48	0.86	Agree
Computers do not scare me at all	3.32	0.75	Agree
I do not like talking with others about computers	1.59	1.95	Disagree
I like to use computers in teaching	3.20	0.77	Agree
Computers are fast means of getting information	3.07	0.80	Agree
I would like to learn more about computers	3.05	0.80	Agree
Cluster	**3.08**	**0.92**	

Table 1 shows that preschool teachers in Benin Metropolis agree that computers would help to organize their work, make subject matter more interesting, save time and effort, be enjoyable, make one more productive, offer real advantage, have proved to be effective learning tools, enhance students' learning, improve education, and are fast means of getting information. They also agree that they like to use computers in teaching, and computers do not scare them. However, they disagree that they would rather do things by hand than with a computer and do not like talking with others about computers. The cluster mean of 3.08 and 0.92 implies that the attitude of pre-primary school teachers towards ICT in Benin Metropolis was positive.

Table 2: Knowledge of ICT by Pre-school Teacher in Benin Metropolis, Edo State

Items	Mean	Standard deviation	Remarks
I am computer literate	3.99	0.52	Agree
I can use programmable toys to teach	2.49	0.91	Disagree
I know of Websites	3.92	0.50	Agree
I can teach with educational software	3.32	0.82	Agree

I can teach using a touchscreen	3.54	0.77	Agree
I have adequate knowledge of interactive whiteboards	3.65	0.72	Agree
I can use digital play materials to teach	3.35	0.84	Agree
I communicate with parents using WhatsApp	2.95	0.96	Agree
I have adequate knowledge of digital toys	2.18	1.22	Disagree
I have adequate knowledge of emails	2.98	0.83	Agree
Cluster	**3.24**	**0.81**	

According to Table 2, preschool teachers in Benin Metropolis agree that they are computer literate, have knowledge of Websites, teach with educational software, teach using the touch screen, have adequate knowledge of interactive whiteboards, use digital play materials to teach, communicate with parents using WhatsApp, and have adequate knowledge of emails. However, they disagree that they use programmable toys to teach and have adequate knowledge of digital toys. The cluster mean of 3.24 and standard deviation of 0.81 implies that the level of knowledge of ICT by preschool teachers in Benin Metropolis was moderate.

Table 3: Application of ICT by Pre-school Teacher in Benin Metropolis, Edo State

Items	Mean	Standard deviation	Remarks
Computers	2.83	1.21	Sometimes
Programmable toys	2.41	1.28	Rarely
Website	3.29	1.12	Sometimes
Educational software	3.36	1.04	Sometimes
Touch screen	2.88	1.05	Sometimes
Interactive whiteboards	3.04	1.01	Sometimes
Digital play materials	2.76	1.06	Sometimes
WhatsApp	2.76	1.06	Sometimes
Digital toys	2.93	1.04	Sometimes
Emails	1.75	1.03	Rarely
Cluster	**2.80**	**1.09**	

According to Table 3, preschool teachers in Benin Metropolis sometimes apply computers, websites, educational software, touch screens, interactive boards, emails, WhatsApp, and digital toys in teaching. However, they rarely use programmable toys and emails for teaching. The cluster mean of 2.80 and standard deviation of 1.09 indicate that the level of application of ICT by preschool teachers in Benin Metropolis was moderate.

Table 4: ANOVA of the Attitude, Knowledge and Application of ICT by Pre-school Teacher Towards the Use of ICT in Benin Metropolis, Edo State.

Model	Sum of Squares	df	Mean Square	F	Sig.	Remarks
Regression	15343.24	3	5114.41	20.45	.000	Significant
Residual	139050.58	556	250.09			
Total	154393.82	559				

$R = 0.315$; Adjusted $R^2 = 0.095$

According to Table 4, the F value of 20.450 and a p-value of 0.000 indicate that the sex, age, and experience of pre-school teachers significantly predict their attitude, knowledge, and application of ICT in teaching ($p<0.05$). The adjusted R-square value of 0.95 implies that the sex, age, and experience of pre-school teachers jointly explain about 9.5% of the total variance of pre-school teachers' attitude, knowledge, and application of ICT in teaching.

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	109.242	2.664		41.013	.000
	Gender	-14.100	1.978	-.344	-7.130	.000
	Age	9.068	3.306	.193	2.743	.006
	Experience	-5.115	3.876	-.093	-1.320	.188

Table 5 shows a beta value of -0.344, a t-value of -7.130, and a p-value of 0.000. This implies that gender is a significant predictor of preschool teacher's attitudes, knowledge, and application of ICT in teaching ($p<0.05$). The beta, t, and p-values of 0.193, 2.743, and 0.006 indicate that age is a significant predictor of preschool teacher's attitude, knowledge, and application of ICT in teaching ($p<0.05$). However, the beta, t, and p-values of -0.093, -1.320, and 0.188 indicate that experience is not a significant predictor of preschool teacher's attitude, knowledge, and application of ICT in teaching.

Discussion of Findings

The study shows that the attitude of pre-primary school teachers towards ICT in Benin Metropolis was positive, which is in line with earlier studies by Youssef et al. (2012), Parilah and Josclyn (2015), Agboola (2016), and Eremina and Isom (2022). The study further shows that the level of knowledge and application of ICT by preschool teachers in Benin Metropolis was moderate, which is consistent with the studies by Ifeoma et al. (2013) but disagree with Fakeye (2010) and Oladosun (2012). Other findings from the study were that sex, age, and experience of preschool teachers significantly predict their attitude, knowledge, and application of ICT in teaching. They jointly explain about 9.5% of the total variance of preschool teachers' attitudes, knowledge, and application of ICT in teaching. Gender was a significant predictor of preschool teachers' attitudes, knowledge, and application of ICT in

teaching, and age was also a significant predictor. However, experience was not a significant predictor, which corroborates the studies by Onasanya et al. (2011), Omoniyi and Quadri (2013), and Agboola (2016).

Conclusion

Based on the findings of the study, it was concluded that preschool teachers in Benin Metropolis had a positive attitude towards ICT in learning and teaching, while their knowledge and application of ICT tools were moderate. Additionally, it was observed that the sex and age of pre-school teachers significantly predict their attitude, knowledge, and application of ICT in learning and teaching. However, teacher's experience did not contribute significantly to preschool teachers' attitudes, knowledge, and application of ICT in learning and teaching.

Recommendations

Based on the findings, the following recommendations are made:

1. Organize intensive computer-based programs for preschool teachers in the form of in-service training, seminars, workshops, and short courses to enable effective application of ICT tools.
2. Incorporate learning how to teach using technology into the courses at every teacher preparation program in tertiary institutions to build their interest in teaching with technology at an early age.
3. Make the use of technology compulsory for teaching at the pre-schools so that children will be introduced to technology early in life.

References

Agboola, M. O. (2016). *Teacher Attitudes Towards Using ICT as an Educational Tool: The Case of Nigerian Secondary School Teachers in the City of Ibadan and Abuja*, Thesis Submitted to the Institute of Graduate Studies and Research, Eastern Mediterranean University, Gazimağusa, North Cyprus.

Alazam, A. O., Bakar, A. R., Hamzah, R., & Asmiran, S. (2013). Teachers' ICT skills and ICT integration in the classroom: The case of vocational and technical teachers in Malaysia. *Creative Education*, 3(8), 70-76.

Al-Zaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools. *International Education Studies*, 3, 211-218.

Aslan, A., & Zhu, C. (2016). Investigating variables predicting Turkish pre-service teachers' integration of ICT into teaching practices. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.12437/full.

Bakare, O. (2014). *The Role of Information and Communications Technology in Education*. Unpublished Thesis.

Beacham, N., & McIntosh, K. (2014). Student teachers' attitudes and beliefs towards using ICT within inclusive education and practice. *Journal of Research in Special Educational Needs*, 14(3), 180–191.

Bhat, S. A., & Beri, A. (2016a). ICT immersion in different domains of teaching profession-a literature review. *International Journal of Indian Psychology*, 3(3), 156–166.

Bird, J. (2018). "*This is pretend. We are just playing." Exploring young children's imaginative play with, and educators' provision of, digital technologies in play-based settings*. Doctoral dissertation, University of New England.

Blackwell, C. K., Lauricella, A. R., and Wartella, E. (2016). The influence of TPACK contextual factors on early childhood educators' tablet computer use. *Computer. Education*. 98, 57–69.

Buabeng-Andoh, C. (2015). ICT usage in Ghanaian secondary schools: teachers' perspectives. *The*
International Journal of Information and Learning Technology, 32(5), 300–312.

Dardanou, M., and Kofoed, T. (2019). "*It is not only about the tools! Professional digital competence," in Early Learning in the Digital* Age. eds. C. Gray and I. Palaiologou (London, UK: Sage), 61–76.

Dong, C. (2018). 'Young children nowadays are very smart in ICT' preschool teachers' perceptions of ICT use. *International Journal of Early Years Education*, 1-15

Edmunds, R., Thorpe, M., & Conole, G. (2012). Student attitudes towards and use of ICT in course study, work and social activity: a technology acceptance model approach. *British Journal of Educational Technology*, 43(1), 71–84.

Eremina, A. H. A., & Isom, E. T. (2022). Assessment of early childhood educators' attitude and utilization of information and communication technology in Rivers State, Nigeria: Implication in COVID-19 Era. *EPRA International Journal of Research and Development (IJRD)* 7 (4), 241 – 246

Fakeye, D. O. (2010. Teachers' Qualification and Subject Mastery as Predictors of Achievement in English Language in Ibarapapa Division of Oyo State. *Global Journal of Human Social Science,* 12(3), 1 – 8.

Gilakjani, A. P., & Sabzian, F. (2012). EFL Teachers. Attitudes toward Using Computer Technology in English Language Teaching. *Theory and Practice in Language Studies*, 2 (3), 630-636.

Ihmeideh, F., and Al-Maadadi, F. (2018). Towards improving kindergarten teachers' practices regarding the integration of ICT into early years settings. *Asia Pacific. Educational Research*, 27, 65–78.

Johnston, K., Hadley, F., and Waniganayake, M. (2020). Practitioner inquiry as a professional learning strategy to support technology integration in early learning centres: building understanding through Rogoff's planes of analysis. *Professional. Development in Education*. 46, 49–64.

Kreijns, K., Vermeulen, M., Kirschner, P. A., Hans van Buuren, F., & Van Acker, F. (2013). Adopting the Integrative Model of Behaviour Prediction to explain teachers' willingness to use ICT: a perspective for research on teachers' ICT usage in pedagogical

practices. *Technology, Pedagogy and Education*, 22(1), 55-71. https://doi.org/10.1080/1475939X.2012.754371

Lauricella, A.R., Wartella, E. & Rideout, V.J., (2015), 'Young children's screen time: The complex role of parent and child factors, *Journal of Applied Developmental Psychology* 36, 11–17. https://doi.org/10.1016/j.appdev.2014.12.001

Magen-Nagar, N. & Firstater, E., 2019, 'The obstacles to ICT implementation in the kindergarten environment: Kindergarten teachers' beliefs', *Journal of Research in Childhood Education* 33(2), 165–179. https://doi.org/10.1080/02568543.2019.1577769

Mehra, V., & Far, Z. N. (2013). A scale to measure university teachers' attitudes towards ICT. *International Journal of Teacher Educational Research,* 2(7), 10–25.

Mertala, P. (2019). Teachers' beliefs about technology integration in early childhood education: A meta-ethnographical synthesis of qualitative research. *Computers in Human Behaviour*, 101, 334-349. https://doi.org/10.1016/j.chb.2019.08.003

Mertala, P. (2019). Digital technologies in early childhood education – a frame analysis of preservice teachers' perceptions. *Early Child Development and Care,* 189, 1228–1241.

Nikolopoulou, K., & Gialamas, V. (2015). Barriers to the integration of computers in early childhood settings: Teachers' perceptions. *Education and Information Technologies*., 20, 285–301. https://doi.org/10.1007/ s10639-013-9281-9.

Oladosu, K. (2012). Basic Technology Teachers' Awareness and Attitude Towards the Use Of Information and Communication Technology For Sustainable Development in Lagos State Education Districts: I, IV and VI. *Journal of Education and Practice*, 3(13), 46 - 50

Omoniyi, T., & Quadri, A. T. (2013). Perceived Competence of Nigerian Secondary Schools Teachers in the Use of Information and Communication Technology (ICT). *Journal of Education and Practice* 4(10), 157 – 164.

Onasanya, S. A., Shehu, R. A., Ogunlade, O. O., & Adefuye, A. L. (2011). Teacher's awareness and extent of utilization of information communications technologies for effective science and health education in Nigeria. *Singapore Journal of Scientific Research* 1(1): 49-58.

Ottestad, G., Kelentrić,M., & Guðmundsdóttir, G. B. (2014). Professional Digital Competence in Teacher Education. *Nordic Journal of Digital Literacy*,9(4), 243–249.

Parilah, M. S., & Joscyln, L. E. (2015). ESL Teachers' Attitudes towards Using ICT in Literature Lessons. From http://macrothink.org/journal/index.php/ijele/article/view/7158

Park, E. (2015). *A Case Study Exploring TPACK Framework Within the Context of Early Childhood Education* [Dissertation] Honolulu, Hawaii: University of Hawaii at Mānoa.

Pavlovic, D., Stanisavljevic-Petrovic, Z. & Vulic, T. (2016). The use of ICT in pre-school institutions. New *Trends and Issues Proceedings on Humanities and Social Sciences*. 5, 45-54.

Sargent, A. R. (2017). *Urban Preschool Teachers' Instructional Technology Integration Perceptions and Practices* [Dissertation] Virginia: Hampton University.

Vidal-Hall, C., Flewitt, R., and Wyse, D. (2020). Early childhood practitioner beliefs about digital media: integrating technology into a child-centred classroom environment. *European. Early Child. Education Research Journal*. 28, 167–181.

Verhoeven, Jef C., Heerwegh, Dirk. & De Wit, Kurt (2010) "Information and Communication Technologies in the Life of University Freshmen: An Analysis of Change", *Computers and Education*, 55 (1), 53-66.

Umar, M., Rosnaini, M., & Habibah Ab, J. (2018). A Review of Obstacles to ICT Usage in Nigerian Tertiary Educational Institutions. *International Journal of Human Resource Studies*, 8(4), 169 -179

Youssef A.M.S., Asghar, A., Jamil, I., Iqbal, A., & Yasmin, M. (2012). Role of Motivation and Attitude in Introduction and Learning of English as a Foreign Language in Libyan High School. *International Journal of Linguistics* 4, 366-373.

Yang T and Hong X (2022) Early childhood teachers' professional learning about ICT implementation in kindergarten curriculum: A qualitative exploratory study in China. *Frontier. Psychology*. 13, 1 – 12