ASSESSMENT OF LEVEL OF INFORMATION AND COMMUNICATION TECHNOLOGY COMPETENCY OF PRESCHOOL TEACHERS FOR THE ADOPTION OF ONLINE LEARNING

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Abstract

The twenty-first century classrooms coupled with the demands of the new normal at the face of the Covid-19 pandemic have necessitated effective use of online teaching platforms for adequate teaching and learning to occur. This raises the question of how well-versed preschool teachers in Nigeria are in information and communication technology (ICT). This is for the fact that there is a dearth of research on the subject matter. Thus, the researchers were poised to ascertain or assess the level of ICT competency of preschool teachers for the adoption of online teaching during and after Covid-19 pandemic. This research was based on the scientific research paradigm and quantitative research approach, utilising descriptive survey research design. A sample of 165 preschool teachers in Nsukka Education zone of Enugu state, Nigeria participated in the study. An ICT competency questionnaire which was properly validated, and trail tested was used for data collection. The internal consistency reliability index of the questionnaire was estimated to be 0.87 using Cronbach Alpha reliability method. Mean statistical tool was used to analyse the data to provide answer to the research question. It was found that preschool teachers had low level of ICT competency for the adoption of online teaching. It was also revealed that age had no significant influence on preschool teachers' level of ICT competency. This implies that effective online teaching cannot be achieved if the teachers are not subjected to in-service training on the use of ICT in teaching. Thus, it was recommended that Local Government Education Authority should provide in-service ICT training opportunities for the teachers to ensure proper utilization of ICT in teaching.

Keywords: Assessment, Information and communication technology, Online teaching, Preschool teachers.

1 INTRODUCTION

It is no longer a news that the traditional way of teaching and learning in schools is no longer suitable for the twenty-first century classrooms. Besides, the emergence of covid-19 has forced most developed countries to adopt the remote or online medium of teaching and learning. In line with the above, [1] noted that following the COVID-19, many countries and educational sectors have been obliged to implement online learning. Information and communication technology (ICT) is widely considered as a reliable vehicle for supporting educational change and progress on a global scale [1]. According to the International Society for Technology in Education's 2019 requirements, learners must be prepared to use digital media in the twenty-first century for learning, teaching, gathering, generating, and sharing information for educational objectives [2]. In addition, as prospective teachers of 21st century learners, practitioners should broaden their students' online, distance, or blended (both on-line and face-to-face) learning experiences [2]. University teaching and learning have been transformed by rapid advances in information and communication technology (ICT) [3]. In the previous two years, the usage of ICT has transformed the way/mode of delivering education and pedagogy, resulting in a variety of learning opportunities for students [4]. Both for teacher training and for delivering high-quality education, information and communication technology is critical [5]. Students use ICT to look up more knowledge in order to improve their personalized learning and creativity [4]. The use of Information and Communication Technologies (ICT) in the teaching-learning process is becoming increasingly popular among educational institutions [6]. However, the success of projects aiming at accomplishing this goal is contingent on teachers and parents' acceptance of the concept [6]. In comparison to instructors working in high schools or general/vocational lyceums, teachers working in elementary schools were more likely to use mobile devices in class [7].

At this face of the current situation, one begins to wonder how well-versed or competent preschool teachers in Nigeria are in the use of information and communication technology (ICT) for the purpose of classroom instruction. The introduction of information and communication technology into the educational

environment has resulted in the growth of digital competence among teachers, which is one of the educational difficulties that teacher education is currently facing [8]. The ability/competency of teachers to incorporate information and communication technology (ICT) into the teaching-learning process is a critical factor [9]. Hence, it becomes necessary to assess the level of ICT competency of preschool teachers for the adoption of online teaching during and after Covid-19 pandemic. The integration of ICT in education is influenced by teacher and student orientation to ICT for online learning, motivation, and school leadership practices [1]. Technical support infrastructure (competent support staff, ICT tools and systems, internet, and stable power supply), as well as policy support infrastructure (ICT policy, ICT policy implementation plan, and clear ICT vision) all worked as antecedents to ICT adoption in Zimbabwean universities [3]. The most important antecedents of e-learning efficiency, according to the findings, are motivational variables and virtual competency [4]. Early childhood educators lack the necessary digital skills to be considered "digital natives," and they are unable to use ICT in their academic or professional lives [10]. The factors age and gender have an effect on the prediction of teaching staff's level of pedagogical digital competence, but the educational stage in which they teach has no effect [11].

Teachers' and students' ICT abilities/competencies, as well as a lack of technical equipment and support, are all important factors in efficient online teaching and learning [12]. Gender, age, and academic degree are all factors that influence, but do not determine, digital skill acquisition [13]. Students' academic progress was primarily influenced by their personal interest in learning, and the pleasure or fulfillment that digital learning exercises may bring during the recent lockdown due to teachers' lack of adequate ICT competency [14]. ICT ownership and everyday use, ICT frequency, professional ICT education or training, and ICT skills are all factors to consider in the adoption of online teaching and learning [15]. As a set of competencies, digital literacy provides the foundation for the teacher's full participation in the knowledge society as well as the involvement of their pupils in revealing their talents [16]. Pre-service teachers have a medium degree of digital competency and are struggling with the content generation component [17]. Only children who were judged to be competent in online learning demonstrated a link between online learning and achievement [18]. Primary school instructors in China tended to limit the function and extent of ICT use in Early Childhood Education rather than incorporating it into the curriculum [19]. Preparation, competences, money, and distance learning equipment are all hurdles to online teaching and learning [20]. The findings suggest that the majority of Indonesian students were ready to study online, but that several criteria, such as ICT competency, hampered their ability to do so [21]. It was revealed that teachers were incompetent in the five digital dimensions, particularly in the generation of digital material [8]. It was revealed that teacher educators do not use digital resources primarily for pedagogical goals, based on self-reported use, competency, and need for professional training in digitalization in teaching [22].

The foregoing has shown that necessary ICT competencies are germane to the adoption of online teaching and learning. It was also observed from the literature that certain factors inhibit teachers effective use of online reaching mode. However, no research in the Nigerian context has been conducted to ascertain the level of ICT competencies of preschool teachers for the adoption of online teaching mode. This gap in literature necessitated this research.

1.1 Research Questions

The questions pursued in this research were:

1   What is the level of ICT competency of preschool teachers for the adoption of online teaching during and after Covid-19 pandemic?

2   What is the influence of age on the level of ICT competency of preschool teachers for the adoption of online teaching?

1.2 Hypothesis

A lone hypothesis was formulated and tested at 5% probability level.

Ho: Age has no significant influence on the level of ICT competency of preschool teachers for the adoption of online teaching.

2   METHODS

This research was based on the scientific research paradigm and quantitative research approach, utilising descriptive survey research design. A sample of 165 preschool teachers in Nsukka Education zone of

Enugu state, Nigeria participated in the study. Using a simple random sampling procedure, this sample was drawn from a population of 1,768 preschool teachers in the Nsukka Education Zone. In the first stage, a simple random selection method was employed to choose 24 primary schools from the full population of primary schools in the study area. The preschool teachers from the sampled schools were then chosen at random using a simple random selection procedure. This method of sampling was employed to ensure that each preschool teacher in the study had an equal chance of being selected. The data were gathered through a questionnaire developed by the researchers about preschool teachers' ICT competency. The questionnaire was divided into two sections: section A and section B.

The researchers were able to collect demographic data from the participants in Section A, and information on the preschool teachers' ICT competency in Section B which had 15 items (*see Appendix A*). The items in the questionnaire were rated on a four-point Likert scale: strongly agree, agree, disagree, and strongly disagree. Two experts in early childhood care and education, as well as one expert in educational research, all from the University of Nigeria, Nsukka's Faculty of Education, validated the instrument/measure. The specialists were in charge of double-checking the instrument's items against the study's goals. The validators' feedback was used to make improvements to the instrument prior to trial testing. Following that, 20 preschool teachers who were not involved in the study were given copies of the instrument for trial testing. To establish the internal consistency dependability of the instrument's items, the data were subjected to a Cronbach alpha reliability estimate. As a result of the findings, the investigation received a dependability index of 0.87. The research ethics committee at the University of Nigeria gave its approval to the study's conduct. Prior to data collection, participants were given informed consent forms to sign. Each of the participating schools' heads provided timely permission letters to get access to the study settings. Data were gathered during visits to each of the study's participating schools. As a result, a method for administering the device on-the-spot was selected. Participants were given copies of the instrument at their respective schools and given 20 minutes to respond before being picked up. Data collected were analysed using mean and analysis of variance to answer the research questions and test the null hypothesis respectively.

3 RESULTS

The results were presented in line with the research questions and hypothesis

Research Question One: What is the level of ICT competency of preschool teachers for the adoption of online teaching during and after Covid-19 pandemic?

Table 1: Mean analysis of the ratings of the preschool teachers' ICT competency

S/No	Item Statement	Mean	Std. Deviation	Remark
1	Ability to boot computer	1.78	.90	LC
2	Being able to shut down the computer	1.66	.79	LC
3	Using computer to prepare lesson materials	1.65	.77	LC
4	Getting lesson materials on the internet	1.67	.81	LC
5	Ability to browse the internet	1.65	.77	LC
6	Using projector to deliver lesson materials	1.74	.72	LC
7	Giving students assignment using computer	1.53	.76	LC
8	Carrying out assessment of the students' learning outcome using the google forms	1.53	.76	LC
9	Scoring the students online	1.54	.78	LC
10	Making lesson materials available online for students to access	1.54	.79	LC
11	Ability to prepare PowerPoint slides	1.55	.81	LC
12	Ability to carry out PowerPoint presentation	1.55	.81	LC
13	Ability to give students feedback via the email	1.52	.75	LC
14	Ability to communicate with the students online	2.23	.78	LC
15	Ability to use blackboard collaborate for teaching purpose	2.45	.95	LC
	Overall	**24.41**	**8.55**	**LC**

*LC = Low Competent

Table 1 shows that the mean ratings of the preschool teachers on items 1 to 15 are within the mean range of 1.50 to 2.49, implying that their level of ICT competency is low with an overall mean score of 24.41 and standard deviation of 8.55.

Research Question Two: What is the influence of age on the level of ICT competency of preschool teachers for the adoption of online teaching?

Table 2: Mean scores of the preschool teachers' ICT competency based on age

Age	n	Mean	Std. Deviation
20-26 years	29	25.17	10.47
27-30 years	45	24.24	7.98
31-35 years	33	24.84	8.80
36 years and above	58	23.93	7.96

Table 2 shows that preschool teachers who are within the age range of 20-26 years had mean ICT competency score of (M = 25.17, SD = 10.47), those within the age range of 27-30 years has mean ICT competency score of (M = 24.24, SD = 7.98), those within the age range of 31-35 years had mean ICT competency score of (M = 24.84, SD = 8.80) while those within the age range of 36 years and above had mean ICT competency score of (M = 23.93, SD = 7.96). Figure 1 showed the mean plots of the ICT competency of the respondents based on age.
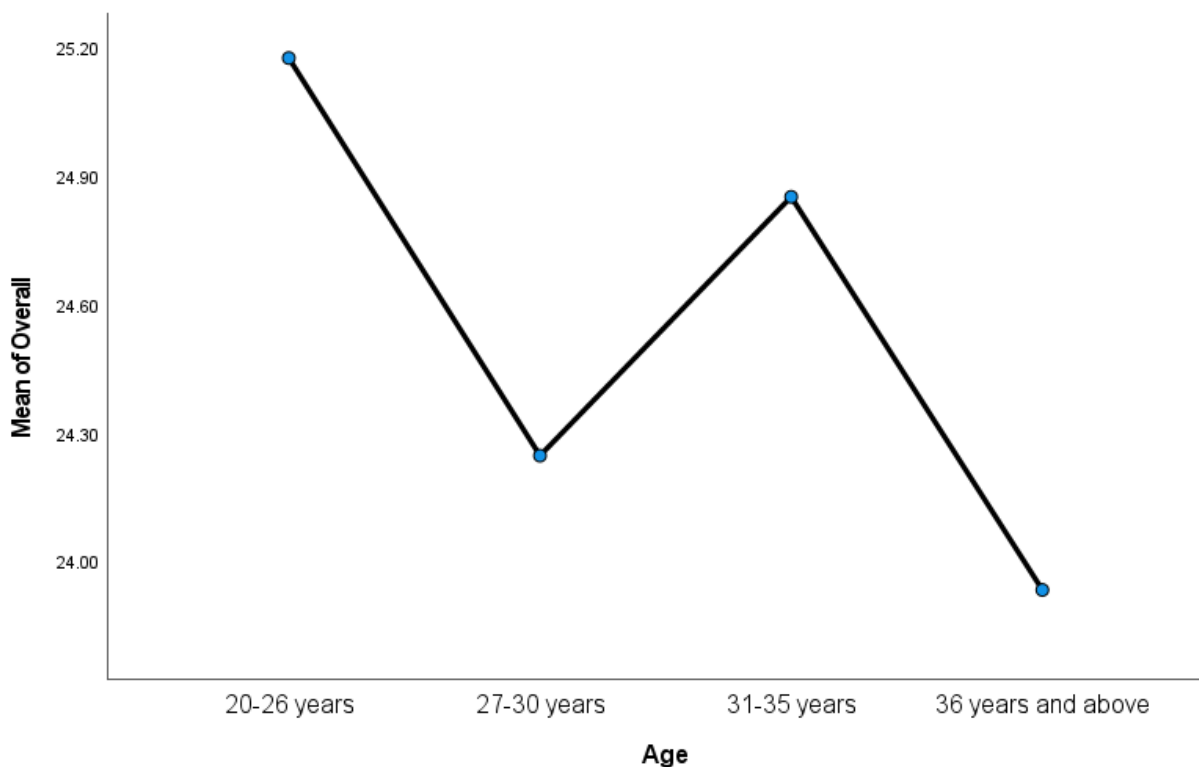

Figure 1: Mean plot of the ICT competency level of the teachers

Ho: Age has no significant influence on the level of ICT competency of preschool teachers for the adoption of online teaching.

Table 3: Analysis of variance of the influence of age on the level of ICT competency of preschool teachers for the adoption of online teaching.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	37.730	3	12.577	.169	.917
Within Groups	11968.416	161	74.338		
Total	12006.145	164			

Table 3 revealed that there is no significant influence of age on the level of ICT competency of preschool teachers for the adoption of online teaching, $F(3,161) = .169$, $p = .917$. Thus, the null hypothesis was not rejected since the p-value of .917 is greater than the .05 level of significance. This implies that age of preschool teachers does not influence their ICT competency.

4   DISCUSSION OF THE RESULTS

This research sought to find out the ICT competency level of preschool teachers for the adoption of online teaching mode. The results of the research showed that preschool practitioners/teachers had low level of ICT competency for the adoption of online teaching mode. This is an indication that the adoption of online teaching mode by the preschool teachers cannot be effective since they possess low level of ICT competency. A number of factors could be responsible for the low ICT competency level of the preschool teachers. It could be that the teachers have not undergone any in-service training on the use of ICT in teaching. Lack of adequate ICT facilities in preschools could also account for it. It was also found that age of the preschool teachers is not a significant factor on their level of ICT competency. Thus, preschool teachers irrespective of their age ranges possessed low level of ICT competency. These findings are being strengthened by recent empirical findings.

Students' academic progress was primarily influenced by their personal interest in learning, and the pleasure or fulfillment that digital learning exercises may bring during the recent lockdown due to teachers' lack of adequate ICT competency [14]. Pre-service teachers have a medium degree of digital competency and are struggling with the content generation component [17]. Only children who were judged to be competent in online learning demonstrated a link between online learning and achievement [18]. Primary school instructors in China tended to limit the function and extent of ICT use in Early Childhood Education rather than incorporating it into the curriculum [19]. Preparation, competences, money, and distance learning equipment are all hurdles to online teaching and learning [20]. The majority of Indonesian students were ready to study online, but that several criteria, such as ICT competency, hampered their ability to do so [21]. It was revealed that teachers were incompetent in the five digital dimensions, particularly in the generation of digital material [8]. It was revealed that teacher educators do not use digital resources primarily for pedagogical goals, based on self-reported use, competency, and need for professional training in digitalization in teaching [22]. Gender, age, and academic degree are all factors that influence, but do not determine, digital skill acquisition [13].

5   CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, the researchers concluded that the ICT competency level of the preschool teachers is low, and such cannot guarantee the effective adoption of online teaching mode. In the face of the low ICT competency level of the preschool teachers, the adoption of online teaching mode in the post covid-19 era will be seriously hampered. Thus, the researchers recommended that 1) adequate arrangement for in-service training of teachers on the use of ICT in teaching and learning should be made by the Local Government Education Authority, 2) Local Government Education Authority should ensure adequate provision of ICT facilities necessary for online teaching platform.

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APPENDIX A

Preschool Teachers' ICT Competency Scale

S/no	Item Statement	VHC	HC	LC	NC
1	Ability to boot computer				
2	Being able to shut down the computer				
3	Using computer to prepare lesson materials				
4	Getting lesson materials on the internet				
5	Ability to browse the internet				
6	Using projector to deliver lesson materials				
7	Giving students assignment using computer				
8	Carrying out assessment of the students' learning outcome using the google forms				
9	Scoring the students online				
10	Making lesson materials available online for students to access				
11	Ability to prepare PowerPoint slides				
12	Ability to carry out PowerPoint presentation				
13	Ability to give students feedback via the email				
14	Ability to communicate with the students online				
15	Ability to use blackboard collaborate for teaching purpose				

VHC = Very Low Competent, HC = Highly Competent, LC = Low Competent, NC = Not Competent