

## COMPETENCIES NEEDED BY PRE-PRIMARY SCHOOL TEACHERS FOR EFFECTIVE USE OF DIGITAL TECHNOLOGY IN THE CLASSROOM

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### Abstract

*This study investigated the competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. Descriptive Survey research design was adopted for the study. The population for the study was all the three hundred and seventy-four pre-primary teachers in Nsukka Urban. Stratified random sampling technique was adopted to select 167 pre-primary school teachers. Three research questions guided the study. A 44-item Competencies needed by Pre-primary School Teachers on Use of Digital Technology Questionnaire (CNPSTUDTQ) was constructed by the researchers and used to collect data. Mean and standard deviations were used to answer the research questions. Results revealed that presentation skills, educational robotics skills, and internet usage skills competencies were needed by pre-primary school teachers for effective service delivery using digital technology in the classroom. It was recommended among others that digital technology be provided in pre-primary schools, and training packages and workshops should be made available for pre-primary school teachers to enable them acquire the competencies needed for effective use of digital technology in classroom.*

**Keywords:** pre-primary school teachers, Digital technology.

### Introduction

The use of digital technology in the classroom for pre-primary school teachers has become imperative because of the overwhelming impact of information communication technology on contemporary life. Information and communication technology has transformed every aspect of human life in all ramifications. The impact of this revolution is vividly perceived in the way people live, work, shop, do entertainment, travel, and learn, young children inclusive. With this trend, children today have become technologically conscious. They are immersed in technology to the extent that they love to use phones, laptops, computers, explore the latest games, watch television, and

videos at home and while waiting at the school, shopping mall, and church, among others. Morrison (2012) affirms that children today are technologically oriented. The author further maintains that children are the net generation whose growth, development and learning are intimately tied to large dose of television, videos, electronic games and computers in the home, school and everywhere. These children are growing up naturally with digital technologies that are significant tools in the culture of the home, school, and in their immediate environment.

Digital technology refer to electronic gadgets such as handsets, electronic toys, robots, SMART boards video machines, projector, among others used for dissemination of information and instructional strategies in school. They are electronic tools, systems, devices and resources that generate, store, or process data. Morrison (2012) states that such tools commonly in use in early childhood programme include computers, mobile devices like smart phones and tablets, smart boards, the internet, cameras, iPhones, iPads, digital cameras and many types of assistive technology, online games, social media, mobile phones multimedia. These devices are used to support learning in pre-primary classroom.

Pre-primary education is education given to children from birth to preschool age. Paris (2002) views early childhood care or pre-primary education; as the initial stage of organised instruction designed primarily, to introduce very young children to a school-type environment. It serves as a bridge between the home and a school-based atmosphere. Federal Republic of Nigeria in her National Policy on Education (FRN, 2004) conceptualise it as education given to children in an educational institution prior to their entering into primary school. Children at this level of education are digital natives. Morrison (2012) states that children were born into a digital world where the web, podcast and Google are basic vocabulary words. The author averred that children expect and require a high level of engagement in their learning. They read, write and think differently than other children did ten years ago. They think digitally. Thus, provision of digital technology in the classroom is vital to support teaching and learning.

Digital technology encourages active learning, knowledge construction inquiry and exploration among learners. The devices make it easier for remote communication as well as data sharing to take place between teachers and, or learners in different physical classroom locations (UCLES, 2017). Stepp-Greany (2002) affirms that general use of technology in classrooms enhance increased motivation, improvement in self-concept and mastery of basic skill, more learner-centred learning and engagement in the learning process. Digital technology can be used as a scaffolding tool in the pre-primary classroom. For

instance, digital cameras can be used to create literacy activities for the children. These digital cameras can also be used to document children's learning; daily documentation, wall displays, portfolios. They can be used to create electronic books, child-created books, among others. Digital technology enables children to use Google Earth, an online resource to virtually visit a location they have been learning about. Graziani in Morrison (2012) states that technology resources in the classroom provide the teachers with tools to differentiate, engage the children, and track data to better design instruction. Teachers' role is essential for effective use of digital technology in pre-primary classroom.

A teacher is one who is trained for the purpose of imparting knowledge to the learners. Teacher as stated in the National Policy of Education (FRN, 2004) is an individual that has been professionally trained in any teacher education programme such as from the College of Education, Faculty of Education, Institute of Education, National Teachers' Institute, among others. Pre-primary school teachers are persons specially trained to teach young children and they are known as early childhood educators. Morrison (2012) sees early childhood teachers as professionals who successfully teach all children, promote high professional standard and continually expand their skills and knowledge. In order to meet the demand of digital technology in pre-primary classroom, teachers need to possess digital competence for effective use of digital technology in the classroom. Hence, teachers' competencies need to be guaranteed for effective service delivery in pre-primary classroom.

Competency is the ability to do something to a level that is acceptable. Enete, Amusa and Eze (2009) view competencies as essential knowledge and skills obtainable in a profession and the professionals in the field must possess and be able to demonstrate at optimal level of acquisition and functioning. Teachers' competence in the use of digital technologies involves the ability to orchestrate presentation skills, educational robotics skills, and internet usage skills effectively to perform a host of activities inside the classroom. In other words, teacher competencies refer to the right ways of conveying units of knowledge, application and skills to children using digital technology in the classroom. Pre-primary school teachers need the competencies pertinent for the effective use of digital technology in the classroom. Effective use of digital technology, according to Skov (2016), involves knowledge, skills, and attitude with regards to the use of technology to perform tasks, solve problems, communicate, manage information, collaborate as well as to create and share contents effectively, appropriately, securely, critically, creatively, independently and ethically. Contextually, competency is the knowledge, skill,

and attitudes with regards to the use of technology which the pre-primary school teachers need for effective use of digital technology in the classroom.

Presently, in Nigeria, Nigeria Certificate in Education (NCE) is the minimum qualification for teachers in the country as prescribed in section 5 sub-sections 92 of the National Policy on Education (FRN, 2004). With this, NCE becomes the minimum qualification for teaching in the primary schools in Nigeria. A close look at the operation of NCE holders, in pre-primary and primary schools appears to be a misnomer. One wonders how computer complaint the NCE holders, retired nurses, teachers, other educated retirees and those who possess senior secondary school certificate (according to NERDC's (2006) prescription for pre-primary school teachers). From the onset, these teachers were not trained as early childhood educators or professionals. They are paraprofessionals, and appear to be ignorant of the dictates and needs of young children, especially as regards the use of digital technology in the classroom. The above calibre of teachers appear to lack the competencies needed for effective use of digital technology in the pre-primary classroom. Such competencies include presentation skills, educational robotics skills and internet usage skills.

Presentation skill is an essential skill in teaching and learning, especially when using computer. TechnoHella (2012) advocates that basic presentation skills competencies are needed in the classroom for effective use of technology. Presentation skills include content of subject matter as well as flow of presentation. Presentation is prepared with computer. In other words it is presented using PowerPoint. With digital technology, concepts that are difficult to explain, can be easily presented to the children in a simple way using any presentation software. For example, a teacher wants to teach the life cycle of an insect or mosquito, a complete life cycle can be demonstrated using pictures and animation very effectively through a presentation. PowerPoint presentation can be used to promote emotional intelligence of children, social competence, curriculum implementation, among others. It affords a teacher the opportunity to incorporate visual and auditory aspect to presentation. It allows variety of manipulations by editing or text modification, removal of existing slides and addition of new slides to make lesson more organised and flexible. Gambari, Yusuf and Balogun (2015) maintain that PowerPoint presentations add complementary multisensory events designed to spark an emotional response among learners. This helps maintain learners (children's) attention and improves cognitive achievement.

Educational robotics is a production-based learning module. Lerch (2018) defines robotics as programmable machines or gadgets that can replace humans in performing a range of tasks by executing input commands. It is a

captivating piece of technology, programmed to move, make noise, light up, and follow instructions as directed. In the pre-primary school setting, robots encourage problem-solving, creative thinking, and a healthy sense of competition that drives innovation from learners. It is an interesting way to bring STEM to life for young children. It encourages experimentation, teamwork, problem-solving and knowledge application and tech use in the simplest possible form (DriveMind Group, 2018). It facilitates children's development of fine motor skills, social development, and builds sequencing skills.

Internet usage skills are significant for the use of digital technology. Netliteracy (2012) defined the internet as a network of computers, all over the world, interconnected to each other and available to any individual. The internet is used for many different activities including communication, teaching and learning and dissemination of information, among others. Netliteracy advocates that basic internet usage skills are necessary for effective access to the internet. According to Ukonze and Olaitan (2008), this includes basic processes, operating system basics, software installation from removable, media, step by step downloading software, creating the upload page, create or open a web, testing the page. Pre-primary school teachers appear to lack the internet usage skills. Umar (2002) states that teachers' training has not prepared the early childhood teachers for the realities of their classroom, and the new challenges posed by the new information age. This is a problem. Obiweluzo (2010) affirms that NCE teachers lack the competencies required to teach effectively in the primary schools, pre-primary schools inclusive. In the same vein, Okeke and Edika (2011) state that most teachers lack the competencies in the use of information technologies to procure, process, store, print, and retrieve information from the computers and internet. This is undesirable.

The Nigerian teachers, pre-primary school teachers inclusive, appear to be indifferent to the new wave of change. Ololube in Abiogu (2008) states that many Nigerian teachers have been unable to find effective ways to use technology in their classrooms, or any other aspect of their teaching and learning life. This seem to be true of the pre-primary school teachers. Many of them appear not to be well trained in using ICT in teaching as a means for effective service delivery. Plumb and Kautz (2015) affirm that early childhood educators lack Information and Technology knowledge and related skills as a key barrier to enhancing the use of digital technology. According to the author, this refers specifically to the knowledge required to embed the use of technology in subject teaching. Similarly, Blackwell, Lauricella, Wartella, and Schomburg (2013) maintain that early childhood educators have insufficient

training on technologies to be able to use them effectively in classroom setting. More so, Ihmeideh (2009) states that early childhood schools have insufficient resources to pay for staff to attend trainings, in order to enhance their efficiency. The major issue stem from the fact that pre-primary school teachers' training has not prepared them for the realities of the classroom and the impartation of knowledge and use of information technologies. This is worrisome. This appears to have robbed the pre-primary school teachers of the necessary competencies needed for effective use of digital technology in the classroom. The problem is what happens to the pre-primary school teachers already in the system? Are the teachers competent to use digital technology in the classroom? It is against this background that this study explores the competencies needed by pre-primary school teachers for effective use of digital technology in the classroom.

### **Purpose of the study**

The purpose of this study is to identify the competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. Specifically, the study sought to identify:

1. Presentation skills competencies needed by pre-primary school teachers for the effective use of digital technology in the classroom
2. Educational robotics skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom
3. Internet usage skills competencies needed by pre-primary school teachers in the classroom

### **Research Questions**

The following questions guided the study:

1. What are the presentation skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom?
2. What are the educational robotics skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom?
3. What are the internet usage skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom?

### **Method**

The design is a descriptive survey research. The design is considered to be appropriate for this study since it tends to obtain data from pre-primary school teachers through the use of questionnaire on competences needed by pre-primary school teachers for effective use of digital technology in the

classroom. The study was conducted in Nsukka Urban, Enugu State. The population of the study comprises all pre-primary school teachers in Nsukka Urban. Stratified random sampling technique was adopted to select 167 pre-primary school teachers.

The instrument was a 44-item questionnaire titled Competencies Need by Pre-Primary School Teachers on Use of Digital Technology Questionnaire (CNPSTUDTQ). It was developed by the researchers and used to collect data for the study. The item statements were generated from literature and arranged in three sections A-C in line with the research questions. Section A sought information on presentation skills competencies, while section B elicited information on educational robotics skills competencies and C was on the internet usage skills competencies needed by pre-primary school teachers for effective usage of digital technology in the classroom.

The instrument was assigned a four point response scale of Highly Needed (HN), Moderately Needed (MN), Slightly Needed (SN), Not Needed (NN) with corresponding numerical values of 4, 3, 2 and 1. The instrument was face-validated by three experts, one in Childhood Education, one in Computer Education and one in Measurement and Evaluation, all from the Faculty of Education, University of Nigeria, Nsukka. The comments and suggestions made by them were carefully effected in the final draft of the questionnaire. The instrument was trial tested and the results analysed using Cronbach alpha and the internal coefficient consistency obtained: 0.85, 0.69, and 0.75 respectively. The grand mean is 0.76. The data obtained was analysed using descriptive statistics of mean and standard deviations. The decision was based on mean score of 2.50 and above for acceptance.

## **Result**

The results of the study are presented in line with the research questions in tables 1-3

### **Research Question One**

What are the presentation skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom?

#### **Table 1**

Mean rating and standard deviation of pre-primary school teachers' responses on presentation skills competencies needed for effective use of digital technology in the classroom

S/N	Item Statement	$\bar{X}$	D	Decision
1	Ability to select a slide layout	3.17	0.73	HN
2	Ability to apply a slide design	3.17	0.83	HN
3	Ability to apply a background to a slide	3.35	0.69	HN
4	Ability to customize the colour scheme	3.34	0.78	HN
5	Ability to insert and format WordArt, picture, and clip art	3.33	0.79	HN
6	Ability to draw and format shapes	3.47	0.73	HN
7	Ability to scale, move, and rotate objects	3.38	0.72	HN
8	Ability to apply transitions	3.13	0.74	HN
9	Ability to apply simple animations	3.10	0.86	HN
10	Ability to slide master	2.86	1.01	N
11	Ability to insert and format tables	3.34	0.77	HN
12	Ability to sort slides in Slide Sorter view	3.10	0.90	HN
13	Ability to narrate a slideshow	3.80	0.90	HN
14	Ability to set slide timings	3.95	0.74	HN
15	Ability to add action buttons	3.03	0.88	HN
16	Ability to use screen navigation tools	3.22	0.82	HN
17	Ability to customise headers and footers	3.00	0.92	HN
18	Ability to add screen tips and use screen navigation tools	3.00	0.81	HN
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Key	Grand mean			
	HN	= Highly Needed	N	= Needed

The result in Table 1 indicated that 17 competency items were highly needed while item 10 is moderately needed. All the scores indicate that all the items enumerated in the table are competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. The standard deviations of the scores generated in all the items are small, indicating that variations of the scores from their mean are not much.

### Research Question Two

What are the educational robotic competencies needed by pre-primary school teachers for effective use of digital technology in the classroom?

### Table 2

Mean rating and Standard Deviation of Pre-primary school teachers' responses on the educational robotics skills competencies needed for effective use of digital technology in the classroom.

S/N	Item Statement	$\bar{X}$	D	Decision
19	Ability to follow programmed instructions and not be controlled remotely	3.36	0.72	HN
20	Controlling a physical robot and identifying when it goes wrong	3.13	0.91	HN
21	Selecting a particularly suitable robot for engaging with children	2.94	1.02	N
22	Ability to program robot actions in a logical order	2.93	1.07	N
23	Identify the moving parts (wheels platform) of a robot	3.10	0.93	HN
24	Process the barcode that tells a robot to do something	3.11	0.75	HN
25	Read the barcode (scanner) to robot	2.95	0.94	N
26	Recognise the robot components when shown a picture and describe the function of each	2.95	0.97	N
27	Select the appropriate block corresponding to robot action	2.79	0.94	N
28	Build and program simple robotics projects for children	3.07	0.98	HN
29	Program sequentially the stages involved in using educational robot	3.02	0.97	HN
30	Identify the parts introduction phase	2.88	0.82	N
31	Identify the motors introduction phase	2.98	0.89	N
32	Operate the sensor introduction phase	2.83	0.96	N
33	Operate the remote control introduction phase	2.77	0.79	N
Key	Grand mean			
	<b>HN</b> = Highly Needed			

The data in Table 2 showed that 7 item statements are highly needed, while 9 are needed. The items indicated educational robotics skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. The standard deviations generated from the mean scores are small. This indicates that there are little variations on the items.

### Research Question Three

What are the internet usage skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom?

**Table 3**

Mean rating and standard deviation of pre-primary school teachers' responses on internet usage skills competencies needed for effective use of digital technology in the classroom.

S/N	Item Statement	$\bar{X}$	D	Decision
34	Ability to arrange concepts or titles which are to be browsed from the internet	3.43	0.82	HN
35	Ability to create a (new) folder for the (information materials to be downloaded	3.10	0.88	HN
36	Ability to employ appropriate search engine in locating a website	3.23	0.84	HN
37	Ability to attach appropriate name tag to a folder	3.31	0.86	HN
38	Ability to identify the materials/information needed to be downloaded	3.29	0.77	HN
39	Ability to download materials and save in appropriate devices	3.22	0.89	HN
40	Ability to locate (new) a folder in the system	3.25	0.80	HN
41	Ability to use installed browsers	3.13	0.93	HN
42	Ability to reference downloaded information	2.97	0.85	N
43	Ability to open referenced cites in the internet	3.17	0.81	HN
44	Ability to upload teaching materials to the internet	3.25	0.92	HN

Key Grand mean

**HN** = Highly Needed      **N** = Needed

The result in Table 3 above indicated that ten (10) items statements are highly needed, while one (1) item is need. This indicates the internet usage skills competencies needed by pre-primary school teachers for effective internet use in the classroom. The standard deviation generated from the mean scores on the items is small. This indicates that the score of the respondents are not very far from the mean and from one another's responses.

### Discussion

The findings of the study revealed the presentation skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. These include skills in selecting a slide layout, insert and format picture, set slide timing, among others. The finding is in consonance

with Techno Hella's (2012) views of basic presentation skills competencies needed in the classroom for effective use of technology.

The findings of this study showed the educational robotics skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. These include; ability to follow programmed instructions and not to be controlled remotely, selecting a particularly suitable robot for engaging with children, ability to program robot actions in a logical order, identify the moving part of a robot, among others. The findings of this study agree with the views of Jung and Won (2018); that educational robotic skills competencies are needed for effective use of technology in early childhood programmes.

Additionally, the findings of this study captured the internet usage skills competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. Some of the skills include ability to arrange concepts or titles which are to be browsed from the internet, ability to employ appropriate search engine in locating a website; ability to attach appropriate name tag to a folder, among others. This finding corroborates Okeke and Edika (2011) state that most teachers lack the competencies in the use of information technologies to procure, process, store, print and retrieve information from the computers and internet. Ukonze and Olaitan (2008), and Netliteracy (2012) maintain that basic internet usage skills are necessary for effective access to the internet. Pre-primary school teachers need these competencies for their effective use of digital technology in the classroom.

### **Conclusion**

Pre-primary level of education is a significant period in a child's overall development. It requires the best care and appropriate practices needed for the child's development and learning. The teachers are responsible for engaging the children in technologies in the classroom, applying appropriate presentation skills competencies, educational robots and internet usage skills competencies for effective use of digital technology in the classroom. This will enhance children's creativity and problem-solving skills.

### **Recommendation**

Based on the findings, the following recommendations are made:

- ❖ Pre-primary school teachers should endeavour to build capacity and be ICT compliant.
- ❖ Training packages and workshops should be made available for pre-primary school teachers to enable them acquire the competencies needed for effective use of digital technology in the classroom.

- ❖ ICT experts should be engaged on a regular basis to help update pre-primary school teachers' knowledge and skills in the use of digital technology in the classroom.
- ❖ Government should endeavour to provide adequate number of digital devices for use in pre-primary classroom.
- ❖ Government should make available internet facilities to enable pre-primary school teachers acquaint themselves with the technology and develop the necessary competencies for their use.

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