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RELATIONSHIP BETWEEN PRE-SERVICE TEACHERS' DIGITAL COMPETENCE AND THEIR USE OF TECHNOLOGY FOR CURRICULUM IMPLEMENTATION IN SECONDARY SCHOOLS

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ABSTRACT
The purpose of the study was to ascertain relationship between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria. Correlation research design was used for the study. The population of the study consisted of 3, 260 regular third year students of Faculties of Education in the four Federal Universities who are undergoing their teaching practice in South-East Zone for the 2023/24 academic session. The sample size for this study was made up of 400 third year regular undergraduate students (2023/2024 session) obtained using simple random sampling and purposive sampling techniques. Pre-Service Teachers' Extent of Use of Technology for Curriculum Implementation Questionnaire (PTUTCIQ) and Pre-Service Teachers' Digital Competence Test (PTDCT) were used for data collection. PTUTCIQ and PTDCT were face-validated by three experts. The reliabilities of PTUTCIQ and PTDCT were respectively ascertained using Cronbach Alpha method and Kuder-Richardson-21 to yield scores of 0.74 and 0.81. Data were analyzed using Pearson Product Moment Correlation coefficient. The findings of the study revealed that a high positive and significant relationship existed between pre-service teachers' digital competence and their use of technology for curriculum implementation in South East Nigeria. Based on the findings of the study, it was recommended among others that university administrators should organize seminars and workshops for pre-service teachers on the need to improve their digital competence so as to sustain their use of technology in curriculum implementation.

Keywords: Relationship; Pre-Service; Digital Competence; Use of Technology; Curriculum Implementation.

Introduction

There appears to be a reliance of the teaching-learning process on technology (ICT) owing to the fact that the Covid-19 pandemic has opened the eyes of educators on the need to make a transition from the traditional mode of 'talk and chalk' to the use of technology (Brown, 2020). This is to the extent that pre-service teachers' use of technology for curriculum implementation de-emphasizes teacher-centered approach while emphasizing a student-centered approach to learning. The afore-mentioned scenario transforms the student from being a passive learner to being an active learner. Similarly, Cooper, Warren, Hogan-Chapman and Mills (2020) noted that prospective teachers are more comfortable using

computers when a full technology integration project is completed. Suffice it to say that, pre-service teachers as potential curriculum implementers and transmitters of up-to-date knowledge and skills are expected to possess the requisite digital competence to use technologies for curriculum implementation.

Digital competence refers to one's ability to use digital technologies, communication tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society. Teachers' digital competence refers to the comprehensive set of capabilities, knowledge as well as skills that teachers possess for the effective use of technologies in their educational practices (Dai, 2023). This goes to show that digital competence is pivotal to a pre-service teacher's use of technological devices in the implementation of the curriculum with a view to achieving institutional goals and objectives. Redecker (2017) noted that digital competence involves professional engagement, using digital resources, integrating ICT in the teaching-learning processes and facilitating learners' development of their digital competence. In the context of the current study, it is a pre-service teachers' ability to use technological tools for effectiveness in curriculum implementation. Martin, Budhrani and Wang (2019) pointed out that digital competencies include teaching competences such as course design, technical proficiency, course communication and time management of programmes.

The expectation, in line with global trend, is that pre-service teachers utilize technology in matters of curriculum implementation such as lesson delivery and evaluation of students. However, the observation of the researcher during the teaching practice exercise of pre-service teachers in public secondary schools in South-East, Nigeria was that, despite the ubiquity of digital tools/resources, pre-service teachers still retain their use of the traditional mode of curriculum implementation such as the use of 'chalk and talk' for instructional delivery and use of hand-written test for evaluation of students. This may be traced to the fact that the pre-service teachers appear to lack digital competence and digital self-efficacy to use technology. The question is: do these teachers have the required digital competence yet, appear to lack the ability to use technology for curriculum implementation in secondary schools in South-East, Nigeria? This is the problem that motivated the study.

Purpose of the Study

Specifically, the study sought to determine:

1. The relationship between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria.

Hypothesis

1. There is no significant relationship between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria.

Literature Review

The relevance of digital competence among pre-service teachers in using technology for curriculum implementation

cannot be overemphasized since technology is a manifestation of works that require the use of a computer and other devices for access. There is the need for a paradigm shift in curriculum implementation process from the traditional face to face style to the use of technology and this can happen when pre-service teachers possess the needed digital competence. Ross, Perkins and Bodey (2016) suggested that individuals who express lack of confidence in their capabilities and who actively evade difficult activities are less willing to develop the digital competencies that advance lifelong learning, whereas individuals who demonstrate high self-efficacy are more likely to develop these competencies. In the fast-growing knowledge society, digital competence has become one of the most vital skills. This is because pre-service teachers with teaching information needs will most likely use technology if they have the digital competencies required for their effective use. Digital competence is much more than computer literacy, although having basic computer skills is an aspect of digital competence.

Digital competencies are imperative for accessing information in this generation of technology advancement that most of the information needed for research can be retrieved from electronic sources" (Adeleke & Emeahara, 2016). Pre-service teachers must show a tendency for lifelong learning by acquiring digital competencies to contend with the rapid information growth in the information society and advance themselves for effective curriculum implementation. This is because pre-service teachers' efforts to complement their work with technological resources may be limited due to lack of digital competencies. Pre-service teachers' digital competence could improve their self-efficacy of many teachers in web search as well as curriculum implementation. Skillful use of the Internet and other technological resources as a teaching tool is one such clear need for pre-service teachers who wish to be successful in curriculum implementation. Pre-service teachers involved in curriculum implementation need to be digitally competent because digital information especially from the Internet sources are often unregulated by editors, publishers or peer review.

It is necessary that pre-service teachers develop themselves to be digitally competent in order to successfully use methods in the learning environment. Ata and Yıldırım (2019) suggested that digital competence courses should be included in all teachers' programmes, alongside theoretical courses and practical activities useful for the development of educators. Gon and Raweka (2017) stated that digitally competent teachers can use WhatsApp which has become a new and convenient platform for teaching anywhere and at any time. Digitally competent teachers are expected to incorporate learning activities that engage students to foster active learning. The online platforms are changing the world we live in and the way we learn to live. One of the new original software-based conference room solution is Zoom technology (Nadezhda, 2020). A digitally competent teacher is required to have the ability to use computer application packages such as Microsoft Word, Excel, PowerPoint, the Google Classroom application to send out notice, carryout discussion, create classes, submit assignment, write examinations, grade marks and for sharing ideas among students.

Equally, the ability to use Zoom Cloud Meeting application to share lesson plan, give instruction, swap files with students, communicate directly with the group or individuals as they all see each other and enables synchronous learning. Other social media platforms such as WhatsApp, to stimulate collaborative works, sharing of audio lessons, sending of documents (Ms-Word, PDF, video and audio files) and for communication between teacher and student through audio and video calls. All these, if thoughtfully used, facilitates curriculum implementation.

Dai (2023) investigated English pre-service teachers' digital competence regarding their self-efficacy in information and communication technologies (ICT), their collaboration with colleagues, and the support they received from the infrastructure. The findings of the study revealed that: the association between participants' perspectives on collegial collaboration and digital competence was statistically equivalent to the association between their ICT self-efficacy and digital competence. Similarly, Li (2022) investigated digital competence of Open University teachers from the perspective of curriculum ideological and political education in the system of Guangdong Open University. The findings of the study revealed that the majority of participants did not demonstrate a satisfactory level of digital competence across various aspects. Specifically, less than half of the teachers achieved a basic level of competence in areas such as employing effective teaching methods, adopting high-tech devices and promoting students' digital competence in the curriculum-based learning process, with the exception being the slight advantage in the number of teachers with basic digital competence in class management. Going further, Baturay, Gökçearslan and Ke (2017) investigated the relationship among pre-service teachers' computer competence, attitude towards computer-assisted education, and intention of technology acceptance. The findings of the study indicated that there was a significant and positive relationship among computer competence, attitude towards CAE, and intention to technology acceptance. Looking at the afore-mentioned studies, the deduction that can be made is that much as digital competence and teachers' use of technology have been subjects of intensive researches, none of researches gave prominence to use of technology for curriculum implementation. More so, none of the researches have been carried out in South-East, Nigeria. The need to fill the afore-mentioned gaps informed the current study.

Method

Research Design. The study employed correlation research design which is tailored towards ascertaining relationship between variables (Nworgu, 2015). Correlation design is deemed needful for this study because it enabled the researcher to find out the nature of relationship between two variables. The research design was considered appropriate for this study because it sought the relationship between pre-service teachers' digital competence and their use of technology for curriculum implementation.

Procedure. The population of the study consisted of 3, 260 regular third year students of Faculties of Education in the four Federal Universities who are undergoing their teaching practice (Michael Okpara University of Agriculture, Umudike, Alex

Ekwueme University, Ndufu-Alike Ikwo, Ebonyi State, Nnamdi Azikiwe University, Awka, Anambra State and University of Nigeria, Nsukka, Enugu State) in South-East Zone for the 2023/24 academic session. The sample size for this study was made up of 400 third year regular undergraduate students (2023/2024 session) of Faculties of Education who were undergoing their teaching practice in Anambra and Enugu States. Simple random sampling and purposive sampling techniques were used for the study. Simple random sampling technique was first used to select two Federal Universities out of the four Federal Universities that have Faculties of Education in South-East, Nigeria. Secondly, 20 public secondary schools in each of Anambra and Enugu States where third year regular undergraduate students were undergoing their teaching practice were used. Lastly, purposive sampling technique was used to obtain all the 10 third year regular undergraduate students posted for teaching practice in the 40 schools to give rise to the sample size. Data for the study were collected using Pre-Service Teachers' Extent of Use of Technology for Curriculum Implementation Questionnaire (PTUTCIQ) and Pre-Service Teachers' Digital Competence Test (PTDCT). PTUTCIQ was developed by the researcher. It is made up of 23 items. It was constructed from literature in such a manner that the respondents responded by opting for one of the four response categories viz: Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). The PTDCT was developed by the researcher from literature. It is made up of 12 items. It was constructed in such a manner that the respondents responded by opting for one of the two response categories viz: True (T) and False (F). PTUTCIQ and PTDCT were face-validated by three experts in Faculty of Education, Nnamdi Azikiwe University, Awka. The reliability of PTUTCIQ was ascertained using Cronbach alpha method. This was carried out by administering the PTUTCIQ during teaching practice to 20 pre-service teachers with similar characteristics in Delta State which is outside the study area. The internal consistency of the items in PTUTCIQ was determined using Cronbach statistics. The alpha coefficient obtained was 0.74. The reliability of the PTDCT was tested with KR-20 formular (Kuder-Richardson) after administering the PTDCT to 20 pre-service teachers with similar characteristics in Delta State. In working out the reliability coefficient, each of the items was scored dichotomously, that is, when for each item, a mark is awarded for a correct answer and zero for a wrong answer. The reliability index of PTDCT was found to be 0.81 and was considered high to confirm the PTDCT as reliable.

Data Analysis. Pearson Product Moment Correlation coefficient was used to analyze the data related to the Research Questions by finding the relationship between each pair of variables. Based on the recommendation of Nwana (2007), correlation coefficients, r will be interpreted thus:

0.8 – 1.0 = Very high relationship

0.6 – 0.8 = High relationship

0.4– 0.6 = Moderate relationship

0.2 – 0.4 = Low relationship

0.0 – 0.2 = Very low relationship.

In ascertaining the significance of the hypotheses, p-value was used. Where the

calculated p-value is less than the stipulated level of significance (0.05), the null hypothesis was rejected. Whereas the null hypothesis was accepted where the calculated p-value is greater than or equal to the stipulated level of significance (0.05). All analyses were done both manually and with the aid of the Statistical Package for Social Sciences (SPSS) version 22.

Results

Table 1: Pearson r on Relationship between Pre-Service Teachers' Digital Competence and their Use of Technology for Curriculum Implementation

Source of Variation	N	r	p-value	Remark
Digital Competence Use of Technology for Curriculum Implementation	400	0.715	0.04	High Positive Relationship

Data in Table 1 show that there is a high positive relationship between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria. This is evident by the size of Pearson's Correlation Coefficient r, which is 0.715. Furthermore, the analysis shows that there is a significant relationship between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria. The calculated r (0.715) has *p*-value <0.05. The null hypothesis was therefore rejected.

Discussion

The finding of this study is that a high positive relationship existed between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria. This shows that an increase in digital competence score comes with a corresponding increase in pre-service teachers' use of technology for curriculum implementation and vice versa. In other words, the more literate or technologically savvy a pre-service teacher is, the higher his/her tendency to use technology for curriculum implementation and vice versa. This may be attributed to the inalienable fact that a majority of pre-service teachers who are digital natives are accustomed to the use of technology as many have smart phones which they are used to deploying for academic purposes and other sundry purposes. The finding of the current study is in tandem with that of Baturay, Gökçearslan and Ke (2017) who found that a positive relationship existed between computer competence and intention to technology acceptance. In other words, computer competence is critical to its adoption for curriculum implementation. Contradicting the findings of the current study, Li (2022) found that the majority of teachers did not demonstrate a satisfactory level of digital competence in the use of high-technological devices across various aspects of curriculum. Specifically, less than half of the teachers achieved a basic level of competence in areas such as employing effective teaching methods, adopting high-

tech devices and promoting students' digital competence in the curriculum-based learning process, with the exception being the slight advantage in the number of teachers with basic digital competence in class management. The contradiction may not be unconnected to the attitude of the participants in the different areas of study.

The finding of this study further showed that a significant relationship existed between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria. This depicts that digital competence is critical to the use of technology for curriculum implementation. The finding of this study is in alignment with that of Asing-Cashman, Gurung, Limbu, and Rutledge (2014) who found that pre-service teachers' computer competency was a significant predictor of their attitude toward using technology. However, Asing-Cashman, Gurung, Limbu, and Rutledge contended that high scores on their computer competency indicated strong stances towards using free and open-source tools in their teaching. Similarly, Dai (2023) found that the association between participants' perspectives on collegial collaboration and digital competence was statistically significant.

Conclusion

Obviously, a digitally competent is bound to prioritize the use of technology for various reasons; curriculum implementation inclusive. Again, pre-service teachers especially in this digital age are likely to exude digital competence in the use of technology. Based on the findings of the study, it was concluded that a positive relationship existed between pre-service teachers' digital competence and their use of technology for curriculum implementation in South-East, Nigeria.

Recommendations

In line with the findings, the following recommendations were made:

1. University administrators should organize seminars and workshops for pre-service teachers on the need to improve their digital competence so as to sustain their use of technology in curriculum implementation.
2. School proprietors should insist that pre-service teachers are digitally competent to employ technology in curriculum implementation.

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