DETERMINANTS OF PRESCHOOL TEACHERS' COMPETENCE IN THE USE OF ONLINE TEACHING SPACE DURING AND AFTER THE COVID-19 PANDEMIC

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Abstract

The emergence of coronavirus disease 2019 (COVID-19) in December 2019 brought a drastic change in the mode of learning in schools across the globe. Due to the pandemic, schools across the world were closed down from March 2020 to avoid the spread of the disease. Most schools then had to adopt the remote or online mode of teaching and learning as against the face-to-face mode. Most teachers especially preschool teachers find it difficult to adapt to the new mode of teaching and learning. Thus, the researchers sought the determinants of preschool teachers' competence in the use of online teaching space during and after the COVID-19 pandemic. A correlational research design was adopted for the study using a sample of 48 preschool teachers in the Nsukka Education Zone. Properly face validated and trial-tested psychological and online teaching space competency scales were used for data collection. The internal consistency reliability indices of the psychological and online teaching space competency scales were found to be 0.79 and 0.86 respectively. Data collected were analysed using structural equation approaches. It was revealed that attitude, interest, psychological readiness, professional development, and motivation are significant (p = .05) determinants of preschool teachers' competence in the use of online teaching space. This implies that if those factors are not adequately considered, there will not be an effective use of online teaching space by the preschool teachers. It was thus recommended that the Local Government Education Authority should create a conducive environment for the effective utilization of online teaching space by the preschool teachers.

Keywords: Competence, Covid-19, Online teaching space, Preschool teachers, Structural equation modelling.

1 INTRODUCTION

The drastic change to online teaching space in most countries of the world which was orchestrated by the novel coronavirus disease 2019 (COVID-19), is a major concern to researchers across the globe. Online teaching space is an educational process that occurs over the internet as a form of distance learning [1]. Online teaching space enables preservice teachers with opportunities to interact with children and to be able to promote young children's development and learning with online communication tools [1]. This condition has caused a lot of damage to the quality of education worldwide, especially in Nigeria. Nationwide school closures and the increased quest for online teaching as a result of the COVID-19 pandemic had considerable effects on educational systems [2]. A shift towards digital/online learning as a result of the closure of schools due to the COVID-19 pandemic is a major challenge for mainstream education [3]. As a result of the COVID-19 pandemic teachers at different levels of education have been forced to online teaching and learning (OTL) independent of whether they were prepared [4].

School shutdown in the era of COVID-19 pandemic undoubtedly had an impact on the school-aged children's social practices as a result of the change in the learning mode from face-to-face to online [5]. The change in social practices leads to two major issues of learning mode and competence or skills to learn through distance. Consequently, the attitude of teachers toward school as a learning/teaching and socializing space becomes a major factor [5]. [2] noted that despite the increasing availability of digital teaching solutions for teachers, little research into distance teaching exists so far. Below is the review of empirical studies on the determinants of the online teaching space of teachers.

[6] revealed that teacher-level of digital competence, perceived usefulness of ICT, and school-level factor of support are the most important predictors of teachers' use of ICT. Endowed career-changers expertise, experiences within previous workplaces, and mastering occupation-specific technology are determinants of technology pedagogy beliefs and practice [7]. [4] found that teachers' demographic characteristics such as gender and experience prior to online teaching and learning as well as other factors like the context of the online teaching and learning shift, the innovation potential in education, and cultural orientation, are significant determinants of their effective adoption of online teaching space. Teachers' intention to use digital learning was significantly predicted by the specific self-efficacy in digital learning as well as perceived support [3]. The use of mobile learning applications by teachers was significantly dependent on factors of technology, awareness, training, and experience [8]. [9] found that lack of direct interaction with learners and the sudden change of setting significantly affected the teachers' use of online teaching space. Teachers' prior exposure to online learning, pedagogical knowledge, support system, and technological knowledge were significant factors in their use of online space [10].

The above review showed that studies have been carried out in the area of the factors that determine teachers' use of online teaching space. It was observed that most of the studies reviewed were centered on higher education and very few on preschool teachers. Moreover, none of the studies holistically looked at attitude, interest, psychological readiness, professional development, and motivation as possible determinants of preschool teachers' use of online space. This dearth of literature on the determinants of preschool teachers' use of online space necessitated this research. Thus, the researchers sought determinants of preschool teachers' competence in the use of online teaching space during and after the COVID-19 pandemic. It was therefore hypothesized that attitude, interest, psychological readiness, professional development, and motivation are significant determinants of preschool teachers' use of online space.

2   METHODOLOGY

2.1   Research design

This study adopted a correlational survey research design within the context of structural equation modelling. Structural equation modelling deals with multiple correlations among independent variables and dependent variables. This design has been adopted by [11] [12] [13] in similar studies.

2.2   Study participants

A sample of 48 preschool teachers in the Nsukka Education Zone formed the participants for the study. These participants were randomly sampled from the population of preschool teachers in all the preschools in the Nsukka Education Zone. The random sampling allowed every preschool teacher to be part of the research.

2.3   Measures

Psychological variable scale and Online teaching space competency scale were used for data collection. The psychological variable scale had five clusters (A-E). Cluster A had 20 items structured on a 4-point Likert scale of strongly agree, agree, disagree, and strongly disagree. Cluster A elicited information on the attitude of teachers toward online teaching space. Cluster B had 15 items structured on a 4-point Likert scale of strongly agree, agree, disagree, and strongly disagree. This cluster elicited information on the interest of teachers toward online teaching space. Cluster C had 10 items structured on a 4-point Likert scale of strongly agree, agree, disagree, and strongly disagree. Cluster C elicited information on the psychological readiness of teachers toward online teaching space. Cluster D had 15 items structured on a 4-point Likert scale of strongly agree, agree, disagree, and strongly disagree that elicited information on the professional development of teachers toward online teaching space. Cluster E had 18 items structured on a 4-point Likert scale of strongly agree, agree, disagree, and strongly disagree that elicited information on the motivation of teachers toward online teaching space. Online teaching space competency scale had 20 items structured on a 5-point Likert scale of Very highly competent, Highly competent, Moderately competent, Lowly competent, and Not competent.

2.4 Validation and reliability of measures

The measures that were used for data collection were properly face validated by three experts of which two are psychologists and one is a measurement and evaluation expert. These experts validated the items of the measures in terms of their suitability to the purpose of the study, the vocabulary used for the item construction, the appropriateness of the items to the target audience. Besides, the construct validation of the measures was ensured by subjecting the items of the questionnaire to factor analysis using the principal component matrix with Varimax rotation. The survived items of the measure demonstrated good factor loadings of more than 0.5. The internal consistency reliability indices of the items of the various clusters of the measure were established by trial testing the measures on 10 preschool teachers outside the study area. The outcome of the trial testing was subjected to Cronbach alpha reliability estimate and yielded reliability indices of 0.76, 0.83, 0.81, 0.79, and 0.91 for clusters A, B, C, D, and E of the psychological variable scale with an overall reliability index of 0.79. The internal consistency reliability index of the Online teaching space competency scale was estimated to be 0.86 using the Cronbach alpha method.

2.5 Data procedure

The researchers visited the various schools used for the research in order to get permission to access the schools to carry out the research. Such permission was duly granted to the researchers and then informed consent forms were administered on the participants for them to read, fill and sign before the actual response to the items of the measures. Accordingly, all the participants filled and signed the consent forms, and thereafter, the copies of the measures were administered on them. These copies were completed by the participants and collected on the spot by the researchers.

2.6 Ethical approval statement

The ethical approval to conduct this research was granted by the University of Nigeria committee on research ethics.

2.7 Data analysis

This study adopted structural equation modelling (SEM) statistical approach in order to analyse the data collected from the fieldwork. Analysis of moment structures (AMOS) version 16.0 was used to perform the SEM. In testing the model fit of the data, confirmatory factor index (CFI), Chi-square goodness of fit test, and root mean square error of approximation (RMSEA) were used.

3 RESULTS

Table 1: Model Fit Indices for the Data.

Model	RMSEA	CFI	PCFI	χ^2	p
Default model	.040	.926	.945	115.98	.000

RMSEA = Root Mean Square Error of Approximation, CFI= Confirmatory Factor Index, PCFI = Parsimony Confirmatory Factor Index, χ2 = Chi-Square, p = Probability value

Table 1 shows the goodness-of-fit indices of the data, *RMSEA* = .040; *CFI* = .926, *PCFI* = .945 $\chi2$ (43) = 115.98, *p* =.000. Thus, the *CFI* value which is higher than .90 and the *RMSEA* value less than .05 indicate that the data had an adequate model fit. However, Figure 1 showed the path relationships of the independent variables (attitude, interest, psychological readiness, professional development, and motivation) and the dependent variable (online teaching).
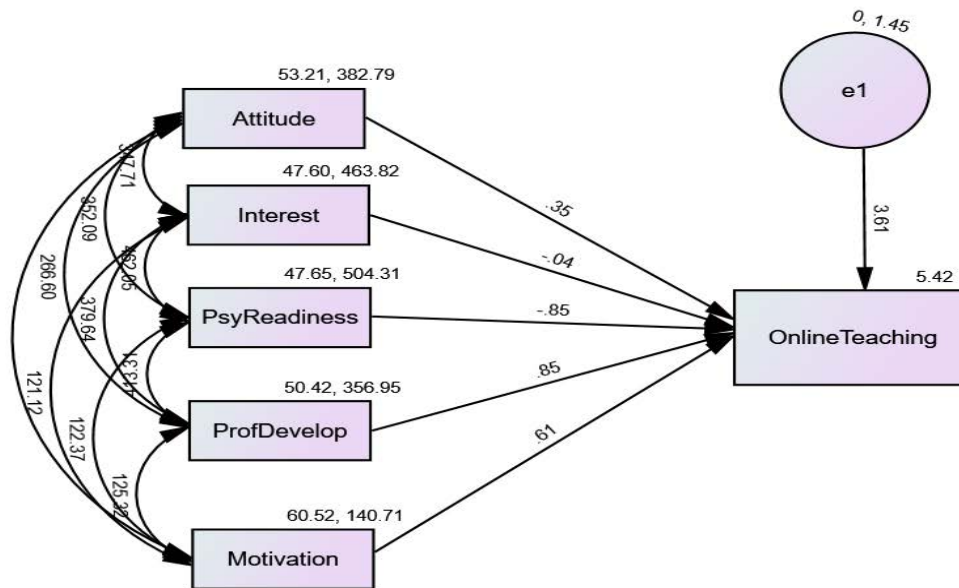
Figure 1: Path diagram of the relationships among the variables.

Table 2: Regression weights of the independent variables on the dependent variable.

	Variables	Estimate	S.E.	C.R.	p
Online Teaching <---	Attitude	.347	.088	3.929	***
Online Teaching <---	Interest	-.041	.110	-.370	.711
Online Teaching <---	PsyReadiness	-.854	.239	-3.566	***
Online Teaching <---	ProfDevelop	.853	.268	3.182	.001
Online Teaching <---	Motivation	.611	.099	6.201	***
Online Teaching <---	e1	3.614			

Note: PsyReadiness = Psychological Readiness, ProfDevelop = Professional Development, e1 = error 1, S.E = Standard Error, C.R. = Critical Ratio, p = Probability value

Table 2 showed the regression coefficient of each of the independent variables on the dependent variable. It shows that the attitude of teachers had a significant regression coefficient with the teachers' competence in the use of online teaching space, $r = .347$, $p < .05$. In the same vein, psychological readiness, professional development and motivation of teachers had significant regression coefficients with the teachers' competence in the use of online teaching space, $r = .-.854$, $p < .05$; $r = .853$, $p < .05$ and $r = .611$, $p < .05$. It is worthy to note that while the psychological readiness of the teachers correlated negatively with their competence in the use of online teaching space, both professional development and motivation correlated positively with their competence in the use of online teaching space during the COVID-19 pandemic. However, the interest of teachers had no significant negative regression coefficient with teachers' competence in the use of online teaching space, $r = -.041$, $p = .711$.

4 DISCUSSION

The researchers in this study sought to explore the determinants of preschool teachers' competence in the use of online teaching space during and after the COVID-19 pandemic. The results of the study showed that attitude, psychological readiness, professional development, and motivation are significant determinants of preschool teachers' competence in the use of online teaching space. Among these significant factors, psychological readiness correlated negatively with the teachers' competence in the use of online teaching space. This result may have suggested that the sudden emergence of COVID-19 must have caused the teachers to be psychologically imbalanced or destabilized making them less ready to accept the online teaching space that was orchestrated by the pandemic. On the other hand, attitude, professional development, and motivation correlated positively

with the teachers' competence in the use of online teaching space. This result indicated that attitude, professional development, and motivation of teachers are factors that must be considered paramount for teachers' competence in the use of online teaching space during and after COVID-19. Despite that there is a dearth of literature on the determinants of preschool teachers' competence in the use of online teaching space during and after the COVID-19 pandemic, few studies were identified.

The use of mobile learning applications by teachers was significantly dependent on factors of technology, awareness, training, and experience [8]. Teacher-level of digital competence, perceived usefulness of ICT, and school-level factor of support are the most important predictors of teachers' use of ICT [6]. Teachers' intention to use digital learning was significantly predicted by the specific self-efficacy in digital learning as well as perceived support [3]. Endowed career-changers expertise, experiences within previous workplaces, and mastering occupation-specific technology are determinants of technology pedagogy beliefs and practice [7]. Teachers' demographic characteristics such as gender and experience prior to online teaching and learning as well as other factors like the context of the online teaching and learning shift, the innovation potential in education, and cultural orientation, are significant determinants of their effective adoption of online teaching space [4]. Lack of direct interaction with learners and the sudden change of setting significantly affected the teachers' use of online space teaching space [9]. Teachers' prior exposure to online learning, pedagogical knowledge, support system, and technological knowledge were significant factors in their use of online space [10]. This result have implications for the quality of teaching in preschool through online teaching space. This result implies that for teachers to be highly competent in the use of online teaching space, they must have a positive attitude toward the use of online teaching. The teachers also must have to be motivated promptly and sponsored for professional development programs in the online teaching space.

5   CONCLUSION AND RECOMMENDATIONS

This research has revealed that the major determinants of preschool teachers' competence in the use of online teaching space are attitude, professional development, and motivation. These factors correlated significantly and positively with the teachers' competency in the use of online teaching space during and after the COVID-19 pandemic. Thus, it was recommended among others that:

1   Teachers should try to maintain a positive attitude toward the use of online teaching space.

2   The local government education authority should be able to expose teachers to professional development programs in the online teaching space.

3   Adequate arrangements should be put in place to motivate preschool teachers to function effectively in the use of online teaching space.

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