Determining Pre-Service Business Education Teachers' Self-Reliance Levels In Pedagogical Content Knowledge In Kogi State, Nigeria

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Abstract
With the new normal occasioned by advancement in technology and impact of COVID-19 pandemic, this study investigated business teachers' self-reliance levels on technological pedagogical content knowledge (TPACK). This study investigated preservice business education teachers' ratings of self-reliance level in pedagogical content knowledge. Through online survey on convenience sampling technique, data was generated from 105 respondents in Kogi state which was analyzed using descriptive and inferential statistics to answer the two research questions and a hypothesis raised for the study. The results showed that business teachers had low self-reliance ratings on the seven domains of the TPACK irrespective of the educational levels. Thus, it becomes imperative to revamp the business education teacher training programs through emergency attention in funding and capacity building.
Keywords*: technological pedagogical content knowledge, business teachers, self-reliance ratings and teacher training program*

INTRODUCTION

A major feature of the teacher training program is the inclusion of pedagogy (methods and practice of teaching). In relation to the teacher preparation, pedagogy emphasise the learner, the teaching environment, the art of teaching and evaluation in addition to the subject matter, (Kilic, 2009). This implies the context of Pedagogical Content Knowledge (PCK) and recent years, much attention has been given to the self-confidence by the preservice teacher training candidates in Pedagogical Content Knowledge as a means of assessing the effectiveness of teacher training program, (Nilsson and Karlsson, 2019). The higher level of confidence (reliance) on the PCK relate to the higher level of teacher performance, though there are varied conceptualisation of the concept of Pedagogical Content Knowledge.

Shulman (1986) introduced the concept of Pedagogical Content Knowledge and describe the concept as the ways of representing and formulating the subject that make it comprehensible to others which includes teachers' knowledge about specific topics that might be easy or difficult for students and possible conceptions or misconceptions that student might have related to the topic. Pedagogical Content Knowledge (Shulman 1987) include seven knowledge domains for teachers:

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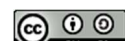
subject-matter knowledge; general pedagogical knowledge; pedagogical content knowledge; knowledge of learners and learning; curriculum knowledge; knowledge of educational contexts; and knowledge of educational philosophies, goals, and objectives. According to Shulman, a teacher should know the content, pedagogy, curriculum, and the interaction between them.

In subsequent years, Technological Pedagogical Content Knowledge (TPACK) became a build up to PCK which attempts to identify the nature of knowledge required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of teacher knowledge, (Meric, 2014). Technological pedagogical content knowledge is a current framework in teacher education which focuses on the heart of technology integration by proposing an integration of pedagogical content knowledge (PCK) and technology knowledge (TK). Since the 1980s, technological improvement in the field of education has accelerated. After this, technology knowledge has become an important component of teaching and learning. Solely technological knowledge can be defined as the ability to use hard and soft technologies. Thus, the transformation of "Pedagogical Content Knowledge" into "Technological Pedagogical Content Knowledge" should be seen as an expected result. TPACK has been defined as integrative, innovative, contextual, and complex knowledge of pedagogy, content, and technology (Angeli & Valanides, 2009; Harris et al., 2010; Koehler & Mishra, 2009). This approach proposes three important components of teaching as pedagogy, content, and technology. Surely, the crucial point is to merge these components in teaching. Koehler and Mishra (2009) propose seven sub-domains under the TPACK framework: content knowledge (CK), pedagogical knowledge (PK), pedagogical content knowledge (PCK), technology knowledge (TK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK),

In the present study, the Pedagogical Content Knowledge (PCK) would include technological components. This is because no teacher is seen to be effective in this 21st century without involving the use of technology in teaching. Consequently, no teacher training program could be relevant if it ignores the important role of Information and Communication Technology in teaching. Accordingly, the teacher training programs in Nigeria (Kogi inclusive) have ICT contents in the curriculum. For instance, Hamilton-Ekeke and Mbachu (2015) posited inclusion of ICT course in the curriculum of the teacher training program in the countries. This is in the realisation of the role of ICT in teaching and learning pedagogy. Very limited research has been carried out in Nigeria on teachers' self-reliance on TPACK with one focussing only on educational technology, (Adeoye and Ojo, 2014). This study examined preservice teachers' perception on the TPACK using Educational Technology in a teacher training program and found out that there was low application of educational technology. The present research is focussed on Pedagogical Content Knowledge of the preservice teachers in Kogi State from 2019 – 2021. The subjects are those enrolled and graduated in the teaching program in preparation to entry into teaching career at any chosen level of education in the state.

The research investigated the strengths and weaknesses of the teacher training program in Kogi State through assessment of preservice teachers' self-reliance on the Pedagogical Content Knowledge (PCK). The following specific objectives were examined. First, preservice teachers' self-reliance on the components of Pedagogical Content Knowledge in Kogi State. Second, Influence of teacher training program levels on the preservice teachers' self-reliance on the Pedagogical Content Knowledge in Kogi State.

METHOD

This is exploratory research and quantitative research method was adopted. The study elicited data from the subjects about their self-reliance on the Pedagogical Content Knowledge. In this regard, questionnaire was the instrument employed to generate data through online by convenience sampling technique. Technological, Pedagogical, and Content Knowledge Self-Confidence" scale developed by Mirjam S., Eliana B., Dominik P. (2020) was utilised. The population for the study comprised the new graduates of business teacher training programs in

Kogi state. A total of 105 respondents returned the online survey made of 63 NCE graduates and 42 BEd graduates.

To analyse the data generated, descriptive and inferential statistics (t-test) were employed to determine the likely self-reliance levels and the differences based on educational levels of the preservice teachers on the PCK. Statistical Packages for Social Sciences (SPSS) software was used for computations. The decision rule was based on cut-off of 3.50 (upper limit of the mean of the 5-point rating scale used) to answer the research questions. Therefore, with a mean score of any item of PCK that is greater than or equal to 3.50, the item is high level self-reliance and with a mean score that is less than the cut-off, the item is low. For testing the hypotheses of no difference between educational levels (NCE and Bed holders), the t' test statistical tool was employed with the cut-off probability of 0.05 on two-tailed distribution with a degree of freedom of 106. The researcher takes respective decisions based on the difference between the t' calculated and the critical value of t'. The hypothesis regarding an item is rejected if the 't' calculated is greater than or equal to the critical value of 't'. On the other hand, if the 't' calculated is less than the critical value, the hypothesis is not rejected - this implies that the two groups showed a significant or no significant statistical difference in their opinions on the respective items.

RESULT AND DISCUSSION

The following is the results of a study taken from 105 respondents. Table 1 shows the Self-reliance level on Pedagogical Knowledge (PK) which is an indicator of Technological Pedagogical Content Knowledge.

Table 1. Self-reliance level on Pedagogical Knowledge (PK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I can adapt my teaching based upon what students currently understand or do not understand	3	0,90	Low
2	I can adapt my teaching style to different learners	2,80	0,98	Low
3	I can use a wide range of teaching approaches in a classroom setting.	2,00	0,64	Low
4	I can assess student learning in multiple ways	2,60	1,20	Low

This domain elicited the respondent's knowledge of pedagogy – the art of instructional delivery. The results showed a low level of self-reliance from the pre-service business teachers.

Table 2. Self-reliance level on Content Knowledge (CK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I have sufficient knowledge about my teaching subject.	2,80	0,98	Low
2	I can use a subject-specific way of thinking in my teaching subject.	2,40	0,80	Low
3	I know the basic theories and concepts of my teaching subject.	3,40	0,80	Low
4	I know the history and development of important theories in my teaching subject	3,00	0,90	Low

This domain is about the knowledge of the subject matter – the teaching subject. The preservice business teachers rate themselves low in the content as shown in table 2.

Table 3. Self-reliance level on Technology Knowledge (TK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I keep up with important new technologies.	2,40	0,49	Low
2	I frequently play around with the technology.	2,20	0,40	Low
3	I know about a lot of different technologies.	2,20	0,40	Low
4	I have the technical skills I need to use technology	2,40	0,80	Low

Table 3 presents items that test the knowledge on standard technologies necessary for business teachers and how to operate them. The results show low rating from the preservice business teachers.

Table 4. Self-reliance level on Pedagogical Content Knowledge (PCK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I know how to select effective teaching approaches to guide student thinking and learning in my teaching subject.	2,80	0,98	Low
2	I know how to develop appropriate tasks to promote students complex thinking of my teaching subject.	2,80	0,98	Low
3	I know how to develop exercises with which students can consolidate their knowledge of my teaching subject.	2,60	0,80	Low
4	I know how to evaluate students' performance in my teaching subject.	3,60	0,80	High

The table 4 contents reveal knowledge of pedagogy applicable to specific teaching content, for example, knowing what teaching approaches fit the content and how elements of the contents can be arranged for better teaching. Besides knowing how to evaluate students' performance, business teachers' self-reliance rating was low in this domain.

Table 5. Self-reliance level on Technological Pedagogical Knowledge (TPK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I can choose technologies that enhance the teaching approaches for a lesson.	2,60	0,80	Low
2	I can choose technologies that enhance students' learning for a lesson.	2,60	0,80	Low
3	I can adapt the use of the technologies that I am learning about to different teaching activities.	2,40	0,80	Low
4	I am thinking critically about how to use technology in my classroom.	3,20	0,98	Low

This is knowledge on how teaching can be changed as a result of using particular technologies is revealed in table 5 and the business teachers rating was low.

Table 6. Self-reliance level on Technological Content Knowledge (TCK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I know how technological developments have changed the field of my subject.	3,60	0,80	High
2	I can explain which technologies have been used in research in my field.	2,80	0,75	Low
3	I know which new technologies are currently being developed in the field of my subject.	2,40	0,80	Low
4	I know how to use technologies to participate in scientific discourse in my field	2,40	0,80	Low

Table 6 shows knowledge on how subject matter can be changed by the application of technology. The respondents showed high rating in one out the 5 and this relate to the knowledge of technological developments that have changed business subjects.

Table 7. Self-reliance level on Technological Pedagogical content Knowledge (TPCK)

S/No.	Statements	Mean	Standard Deviation	Decision
1	I can use strategies that combine content, technologies, and teaching approaches that I learned about in my coursework in my classroom.	2,40	0,80	Low
2	I can choose technologies that enhance the content for a lesson.	2,40	0,80	Low
3	I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.	2,60	0,80	Low
4	I can teach lessons that appropriately combine my teaching subject, technologies, and teaching approaches	2,60	0,80	Low

The table 7 shows knowledge of good teaching with technologies and the results reveal low ratings by the respondents (preservice business teachers).

Table 8. Comparison between Self-reliance ratings of NCE and BEd
Preservice Business Teachers in Kogi State

Domains	Statements	Mean		't'	Decision
		NCE	BEd		
pk1	I can adapt my teaching based upon what students currently understand or do not understand	2,33	4,00	-22,69	S
pk2	I can adapt my teaching style to different learners	2,67	3,00	-1,72	NS
pk3	I can use a wide range of teaching approaches in a classroom setting.	2,33	1,50	8,58	S
pk4	I can assess student learning in multiple ways	2,00	3,50	-7,86	S
ck1	I have sufficient knowledge about my teaching subject.	2,67	3,00	-1,72	NS

ck2	I can use a subject-specific way of thinking in my teaching subject.	2,00	3,00	-7,86	S
ck3	I know the basic theories and concepts of my teaching subject.	3,00	4,00	-7,86	S
ck4	I know the history and development of important theories in my teaching subject	2,67	3,50	-5,21	S
tk1	I keep up with important new technologies.	2,33	2,50	-1.72	NS
tk2	I frequently play around with the technology.	2,00	2,50	-7,86	S
tk3	I know about a lot of different technologies.	2,00	2,50	-7,86	S
tk4	I have the technical skills I need to use technology	2,00	3,00	-7,86	S
pck1	I know how to select effective teaching approaches to guide student thinking and learning in my teaching subject.	2,67	3,00	-1,72	NS
pck2	I know how to develop appropriate tasks to promote students complex thinking of my teaching subject.	2,67	3,00	-1,72	NS
pck3	I know how to develop exercises with which students can consolidate their knowledge of my teaching subject.	2,33	3,00	-4,54	S
pck4	I know how to evaluate students' performance in my teaching subject.	3,33	4,00	-4,54	S
tpk1	I can choose technologies that enhance the teaching approaches for a lesson.	2,33	3,00	-4,54	S
tpk2	I can choose technologies that enhance students' learning for a lesson.	2,33	3,00	-4,54	S
tpk3	I can adapt the use of the technologies that I am learning about to different teaching activities.	2,00	3,00	-7,86	S
tpk4	I am thinking critically about how to use technology in my classroom.	2,67	4,00	-9,08	S
tck1	I know how technological developments have changed the field of my subject.	3,33	4,00	-4,54	S
tck2	I can explain which technologies have been used in research in my field.	2,33	3,50	-12,01	S
tck3	I know which new technologies are currently being developed in the field of my subject.	2,00	3,00	-7,86	S
tck4	I know how to use technologies to participate in scientific discourse in my field	2,00	3,00	-7,86	S
tpck1	I can use strategies that combine content, technologies, and teaching approaches	2,00	3,00	-7,86	S

	that I learned about in my coursework in my classroom.				
tpck2	I can choose technologies that enhance the content for a lesson.	2,00	3,00	-7,86	S
tpck3	I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.	2,33	3,00	-4,54	S
tpck4	I can teach lessons that appropriately combine my teaching subject, technologies, and teaching approaches	2,33	3,50	-4,54	S

The t:test statistics presented in table 8 shows significant difference in the self-reliance rating on TPACK between the holders of NCE and the Bed. Very few itesm in the pedagogical knowledge (pk), content knowledge (ck), technological knowledge (tk) and pedagogical content knowledge (pck). This shows that Bachelor of Education business teacher education program is stronger in terms of teacher preparation than the NCE business teacher training program.

The findings of this study revealed a worrisome development in the teacher training program for business teachers in Kogi State. The self-reliance ratings on the seven domains of the pedagogical content knowledge were overwhelmingly low. This is situation exists irrespective of the teacher training programs in the university and the College of Education levels. One may ask – why is this situation? This no doubt is a manifestation of the weakness of the Nigeria educational system, which has been described as fragile and being made worse during the COVID-19 era, (Obiakor and Adeniran, 2020). Particularly, Rotua (2017) decried the deplorable situation of business teacher training program describing it as lacking in qualified teaching staff and technology for affective teacher preparation. The fallout of this deplorable conditions along with the negative impact of the COVID-19 pandemic might be the cause of this unsatisfactory ratings of the preservice business teachers in Kogi state.

CONCLUSION

There is declining self-reliance ratings among preservice business teachers in Kogi State with regard to the technological pedagogical content knowledge. This might be a fallout of the new normal occasioned by advancement in technology and COVID-19 pandemic with the attendant disruption in business teacher training program. All levels of business teacher training programs are equally affected by this situation in the study area – Kogi State.

Based on the conclusions of this study, the following recommendations have been made, 1) There is urgent need to revamp business teacher education program by emergency funding through funding agencies and stakeholders; 2) Massive capacity building on technological pedagogical content knowledge for the business teacher trainers should be mounted at all levels of education in the state; 3) This study should be replicated to cover larger parts of Nigeria to ensure its generalisability on the country.

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