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## Mentor-Supported Technology Professional Development: A Means to Increase Teachers' Use of Technology in the Classroom

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### **Abstract:**

*The study assessed mentor-supported technology professional development as a means to increase teachers' use of technology in the classroom. The study was conducted with the objectives to: determine the extent to which mentor-supported technology professional development increase teachers' use of technology in the classroom, and identify the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom. The study adopted survey research design. The population of the study comprised all the 12,625 teachers in public secondary schools in Lagos State. A sample size of 378 public secondary school teachers from Lagos Mainland was used in the study. This sample size was selected using random sampling technique. A structured questionnaire developed by the researcher was used for data collection. The questionnaire was validated by two experts in the Department of Educational Foundations, National Open University of Nigeria. To establish the reliability of the instrument, a pilot study was conducted and a reliability coefficient of 0.84 was obtained. Data collected in the study was analysed using frequency counts, mean and standard deviation, while chi-square ( $\chi^2$ ) was used to test the formulated null hypotheses at 0.05 level of significance. Findings revealed that to a great extent mentor-supported technology professional development increase teachers' use of technology in the classroom. In addition, institutional barriers, attitudes and beliefs has been identified as the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom. The study recommended among others that mentor-supported model should be used for professional development to enable teachers receive the additional support they need to facilitate change when implementing new strategies.*

**Keywords:** Mentor-supported, technology, professional development

### **1. Introduction**

Technology is increasingly becoming part of our everyday lives and much has been claimed for the contribution technology can have upon the educational practices. There is substantial evidence that, in the right hands and used appropriately for specific purposes in specific contexts, technology can be an effective tool in supporting teaching and learning. The use of technology in classroom has created more stimulating learning atmosphere and new possibilities to make the process of education more innovative and enjoyable. However, it is now firmly established that its integration into the classroom does not by itself improve the quality of education or raise attainment (Alasoluyi, Shaibu & Garba, 2016). Encouragingly, there is growing and widespread awareness that the pedagogical and technical expertise of the teacher is absolutely critical here. Although professional development is a way to improve teachers' technical expertise on the use of technology in the classroom, Bradshaw (2012, p. 131) claimed that "nothing has promised so much and has been so frustratingly wasteful as the thousands of workshops and conferences that led to no significant change in practice when the teachers returned to their classrooms".

Mentor-supported technology professional development might be an appropriate method for meeting the needs of teachers. It is a relationship in which a more experienced or more knowledgeable person helps to guide a less experienced or less knowledgeable person. The mentor may be older or younger than the person being mentored, but he or she must have a certain area of expertise (Fagenson-Eland, Marks, & Amendola, 2007). It is a learning and development partnership between someone with vast experience and someone who wants to learn (Fagenson-Eland, Marks, & Amendola, 2007). Mentorship experience and relationship structure affect the amount of psychosocial support, career guidance, role modelling, and communication that occurs in the mentoring relationships in which the protégés and mentors engaged (Pons, 2009).

Teacher need to have a certain set of skills in order to effectively use technology in the classroom. Mentor-supported technology professional development is a great approach to help teacher get organized and give them access to an expert that can give feedback and help answer questions that they may not know where to find answers to (Odiorne, 2011). Beginning

teachers can benefit enormously from engaging with an experienced educator in a structured way on a regular basis. The mentor-supported technology professional development focuses on professional learning and growth with the aim of elevating teaching standards and improving student outcomes.

Although mentor-supported technology professional development has long been identified as having the greatest influence on the professional development of those in initial teacher training and for newly qualified or novice teachers (Kajs, 2002), there has been considerable research and scholarship in what constitutes effective practice for the development of professional knowledge, skills and expertise through mentoring (Cain, 2009; Malderez et al., 2007). Admittedly, mentoring that is provided by a peer might provide an advantage over mentoring provided by other professionals (Swan & Dixon, 2006). Hence, existing research evidence on how teachers best learn to integrate technology into practice is limited. This paper therefore focused on mentor-supported technology professional development as a means to increase teachers' use of technology in the classroom.

## 2. Review of Relevant Literature

Mentor-supported technology professional development is seen as a tool and a set of processes aimed at helping teacher make their very best contribution to their personal and professional contexts and at the same time gain profound fulfilment and a sense of becoming a professional (Bennett, 2010). In other words, mentoring is concerned with fitting the teacher into an existing professional structure. Teachers need time to receive the needed training to become and remain proficient with technology. With a mentor-supported model of professional development, teachers can be provided with the support they need in order to facilitate change over a long period of time. Schaverien and Cosgrove (2011) averred that there are challenges facing mentor-supported model of professional development such as inadequate hardware, software, internet access, and the likes and that teachers need an extended period of support when they return to their classrooms following training. This is necessary for the teachers to "make sense" of what they had learned and to change their practice.

Mentor-supported professional development has been highlighted as key factors to augment trainers' (that is, teachers') knowledge and skills. According to Smylie (2009), teachers rated "learning from other teachers" as the second most valuable source of information about effective teaching over only their "own teaching experiences." Teachers reported that their colleagues were a more valuable learning source than university professors, administrators, consultants, or specialists. Amico (2005), found that utilizing the teachers in the training process and including them as trainers was valuable because they were familiar with the day-to-day problems of technology and could share the best way to approach specific use of technology in the classroom.

In a study by Holahan, Jurkat and Friedman (2010), showed that a mentor-based teaching model permitted greater efficiency as compared to traditional training approaches. The programme emphasized mutual sharing, learning, and collaboration versus superior-subordinate relationships between the mentors and those who attended training. Swan and Dixon (2006) stated that training should support the innovation of technology as a tool that makes teaching more efficient and not as another layer in the curriculum. According to the President's Committee of Advisors on Science and Technology (PCAST, 1997), teachers should be provided with ongoing mentoring, consultative support, and opportunities for collaboration when attempting to incorporate technology into their lesson plans. Teachers need to reflect and collaborate together following training (Parsad, Lewis, & Farris, 2007; Raywid, 1993). Research findings support the use of professional development as a way to increase teachers' use of technology. However, little research has focused on how teachers best learn to integrate such technology into practice in the classroom. In the light of this background, this study assessed mentor-supported technology professional development as a means to increase teachers' use of technology in the classroom.

## 3. Theoretical Framework

This study finds its theoretical bases on social constructivism principle of knowledge construction. According to Piaget (1953), social constructivism is the *schema* – an individual's internalised representation of an aspect of the world. Learning involves the testing of schemas against the external reality and continually adjusting, extending, interconnecting or contracting schemas to match the internal representation with the external reality. Vygotsky (1978) suggests that a teacher's role is to work alongside the learner, within his or her 'Zone of Proximal Development' to scaffold (Bruner, 1978) experiences which enable the learner to build on existing knowledge and understandings and/or confront misconceptions. Whilst the above implies that it would be advantageous for the mentor to have more knowledge and experience than the teacher. Jacoby and Ochs (1995) advocate the co-construction of knowledge, in which participants learn together, as should be the case with mentoring. However, MortonCooper and Palmer (2000) among others, argue that the rationale for most mentoring techniques can be explained through a cognitive apprenticeship perspective (Kawash & Kommers, 2007; Herrington et al., 2008). Within cognitive apprenticeships, in way similar to the traditional view of the master/apprentice relationship, the 'master' models the behaviours expected of the 'apprentice' through 'cognitive modelling' (Bandura, 1997). Bandura argues that by observing and listening to the master, the apprentice will identify relevant behaviours and develop conceptual models of the processes involved. The apprentice then imitates those behaviours with the master observing and guiding. This theory is very relevant to the study as it revealed the need for mentor to have more knowledge and experience than the teacher in order to enable the teacher gain an insight into his or her own performance by using technology to reinforce a key issue in the classroom.

#### 4. Objectives of the Study

The study was conducted with the objectives to:

- Determine the extent to which mentor-supported technology professional development increase teachers' use of technology in the classroom.
- Identify the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom.

##### 4.1. Research Questions

This study provided answer to the following research questions:

- To what extent do mentor-supported technology professional development increase teachers' use of technology in the classroom?
- What are the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom?

##### 4.2. Hypotheses

The following null hypotheses were postulated and tested at 0.05 level of significance:

- H<sub>01</sub>: There is no significant difference in the extent to which mentor-supported technology professional development increase teachers' use of technology in the classroom.
- H<sub>02</sub>: There is no significant difference in the opinions of teachers on the challenges faced with mentor-supported technology professional development in increasing the use of technology in the classroom.

#### 5. Methodology

The study adopted descriptive survey research design. The population of the study comprised all the twelve thousand six hundred and twenty-five (12,625) teachers in public secondary schools in Lagos State. A sample size of three hundred and seventy-eight (378) public secondary school teachers from Lagos Mainland was used in the study. This sample size was arrived at using the recommendation of Research Advisors (2006) sample size table. In the table, they recommended that for a population of 10,001 – 25,000, the sample size required is 378. Simple random sampling technique was used to select the sample size. In which, no stringent criteria are placed on the selection of the sample, rather than the fact that every member of the population has equal chance of being chosen. A structured questionnaire developed by the researcher was used for data collection. The instrument was a four (4) point rating scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) with the ratings of 4, 3, 2, and 1. Based on the 4-point rating scale, the decision mean of the scale is 2.5. The questionnaire was validated by two experts in the Department of Educational Foundations, National Open University of Nigeria. To establish the reliability of the instrument, a pilot study was conducted and a reliability coefficient of 0.84 was obtained. Data collected in the study was analysed using frequency counts, mean and standard deviation, while Chi-square ( $\chi^2$ ) was used to test the formulated null hypotheses at 0.05 level of significance.

##### 5.1. Data Analysis

This section presents the analysis of the data collected through the administration of questionnaire. The research questions raised in the study were answered using frequency counts, mean and standard deviation.

##### 5.1.1. Research Question 1

To what extent do mentor-supported technology professional development increase teachers' use of technology in the classroom?

To answer this research question, ten items were developed on various issues related to mentor-supported technology professional development as it increases teachers' use of technology in the classroom. The summary of the analysis is presented in table 1.

S/N	Item Statement	SA	A	D	SD	Mean	SD
1.	Mentoring using open questions to develop plans enhances teachers desire to use technology more frequently.	121	29	87	141	2.486	1.163
2.	Teachers' effectiveness and use of technology will continue to be a difficult and slow process without mentor support.	167	140	48	23	3.082	1.363
3.	Knowing how to use technology is a necessary skill for the teachers.	50	31	134	163	1.915	1.018
4.	Ability to observe, analyse and reflect upon professional practice increase teacher's effectiveness in the use of technology.	193	68	72	45	2.640	1.083

S/N	Item Statement	SA	A	D	SD	Mean	SD
5.	Learning about technology is a worthwhile and necessary subject for all prospective teachers.	172	88	63	55	2.997	1.098
6.	Mentors who relate guidance to evidence from practice tend to increase the use of technology in the classroom.	152	108	92	26	2.978	0.982
7.	The use of certain technologies, such as video and other multimedia approaches, appear to generate high levels of take-up and enthusiasm among mentors and teachers.	161	63	92	62	2.854	1.143
8.	Mentor-support motivates teachers to use more technology that benefit students in the classroom.	100	162	49	67	2.481	1.059
9.	Teachers need time to receive the needed training to become proficient with technology.	179	67	71	61	2.963	1.144
10.	Regular sessions between mentor and teachers increase the use of technology in the classroom.	100	34	105	139	2.251	1.206

*Table 1: Extent to Which Mentor-Supported Technology Professional Development Increase Teachers' Use of Technology in the Classroom  
Average Mean = 2.66, Standard Deviation = 1.12*

Table 1 showed that to a great extent mentor-supported technology professional development increase teachers' use of technology in the classroom. The table showed that the average response mean of 2.66 is higher than the rating mean of 2.5. The implication of this result is that, teachers' effectiveness and use of technology will continue to be a difficult and slow process without mentor support as item number 2 on the table attracted the highest response mean of 3.082. Detail shows that a total of 167 teachers strongly agreed, while 140 teachers agreed, against 48 teachers that disagreed and 23 that strongly disagreed with the item.

#### 5.1.2. Research Question 2

What are the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom?

To answer this research question, ten items were developed on various issues related to the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom. The summary of the analysis is presented in table 2.

S/N	Item Statement	SA	A	D	SD	Mean	SD
1.	Teachers are not provided with support and sufficient release time for effective technology-based professional development to occur.	122	50	87	119	2.547	1.164
2.	Without adequate hardware, software, internet access, and the like, mentor support might find it difficult to increase teachers' use of technology in the classroom.	104	33	159	82	2.216	1.251
3.	Teachers with less than full preparation tend to struggle with the use of technology in curriculum delivery.	160	86	48	84	2.851	1.192
4.	Institutional barriers, attitudes and beliefs are the major challenges to effective use of technology in the classroom.	117	134	44	83	3.381	1.252
5.	Limited teaching experience or out-of-field certification hinders frequent use of technology in the classroom.	146	97	62	73	2.865	1.104
6.	Inconsistent electricity is a barrier to effective use of technology in the classroom.	95	106	64	113	2.378	1.166
7.	The lack of availability of resources discouraged teachers desire to use technology more frequently.	99	123	72	84	2.492	1.105
8.	Mentors lack the technical skills to create the type of learning environment teachers need.	160	71	86	61	2.873	1.132
9.	Limited access to the computer labs hampers teachers' frequent use of technology in the classroom.	162	80	79	57	2.918	1.112
10.	Teachers do not have sufficient time in their busy schedules to attend mentor-supported technology professional development they need.	210	40	10	118	1.706	1.020

*Table 2: Challenges Faced with Mentor-Supported Technology Professional Development in Increasing Teachers' Use of Technology in the Classroom  
Average Mean = 2.62, Standard Deviation = 1.14*

Table 2 revealed the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom. The table showed that the average response mean of 2.62 is higher than the rating mean of 2.5. The implication of this result is that, institutional barriers, attitudes and beliefs are the major challenges to effective use of technology in the classroom as item number 4 on the table attracted the highest response mean of 3.381. Detail shows that a total of 117 teachers strongly agreed, while 134 teachers agreed, against 44 teachers that disagreed and 83 that strongly disagreed with the item.

### 5.1.3. Null Hypothesis 1

There is no significant difference in the extent to which mentor-supported technology professional development increase teachers' use of technology in the classroom.

Data gathered through the use of questionnaire was analyzed using chi-square ( $\chi^2$ ) statistics. The summary of the analysis is presented in table 3.

N	$\chi^2$ cal.	$\alpha$	df	$\chi^2$ crit.	P-value	Decision
378	94.5	0.05	27	23.11	.002	Rejected

Table 3: Summary of Chi-Square ( $\chi^2$ ) Statistics on Extent to Which Mentor-Supported Technology Professional Development Increase Teachers' Use of Technology in the Classroom

Table 3 revealed that to a great extent mentor-supported technology professional development increase teachers' use of technology in the classroom. The result showed that the  $\chi^2$  calculated value of 94.5 is greater than the critical value of 23.11 at  $\alpha = 0.05$  and at 27 degrees of freedom. Since the  $\chi^2$  calculated was greater than the critical value, the null hypothesis which states that there is no significant difference in the extent to which mentor-supported technology professional development increase teachers' use of technology in the classroom was rejected.

### 5.1.4. Null Hypothesis 2

There is no significant difference in the opinions of teachers on the challenges faced with mentor-supported technology professional development in increasing the use of technology in the classroom.

Data gathered through the use of questionnaire was analysed using chi-square ( $\chi^2$ ) statistics. The summary of the analysis is presented in table 4.

N	$\chi^2$ cal.	$\alpha$	df	$\chi^2$ crit.	P-value	Decision
378	154.50	0.05	27	45.5	.000	Rejected

Table 4: Summary of Chi-Square ( $\chi^2$ ) Statistics on the Opinions of Teachers on the Challenges Faced With Mentor-Supported Technology Professional Development in Increasing the Use of Technology in the Classroom

Table 4 showed that there was difference in the opinions of teachers on the challenges faced with mentor-supported technology professional development in increasing the use of technology in the classroom. The result showed that the  $\chi^2$  calculated value of 154.50 is greater than the critical value of 45.5 at  $\alpha = 0.05$  and at 27 degrees of freedom. Since the  $\chi^2$  calculated was greater than the critical value, the null hypothesis which states that there is no significant difference in the opinions of teachers on the challenges faced with mentor-supported technology professional development in increasing the use of technology in the classroom was rejected.

## 5.2. Discussion of Findings

The result on hypothesis one revealed that to a great extent mentor-supported technology professional development increase teachers' use of technology in the classroom. The result showed that the calculated value was greater than the critical value. Hence, the null hypothesis which states that there was no significant difference in the extent to which mentor-supported technology professional development increase teachers' use of technology in the classroom was rejected. This finding is in agreement with the finding of Holahan, Jurkat and Friedman (2010), that a mentor-based teaching model permitted greater efficiency as compared to traditional training approaches. It also concurred with the view of Bandura (1997) that by observing and listening to the master, the apprentice will identify relevant behaviours and develop conceptual models of the processes involved. This finding is explained in the context of the fact that an experienced teacher is more familiar

The result on hypothesis two revealed that institutional barriers, attitudes and beliefs has been identified as the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom. The result showed that the calculated value was greater than the critical value. Hence, the null hypothesis which states that there was no significant difference in the opinions of teachers on the challenges faced with mentor-supported

technology professional development in increasing the use of technology in the classroom was rejected. This finding is in accord with the finding of Schaverien and Cosgrove (2011) which revealed that there are challenges facing mentor-supported model of professional development such as inadequate hardware, software, internet access, and the likes and that teachers need an extended period of support when they return to their classrooms following training.

## 6. Conclusion

In the light of the findings from this study, it can be inferred that teachers' effectiveness and use of technology will continue to be a difficult and slow process without mentor support, hence, to a great extent mentor-supported technology professional development increase teachers' use of technology in the classroom. Mentor-support contribute to the development of reflective practice. This could be achieved through face-to-face encounters or remotely through mentoring relationship. However, institutional barriers, attitudes and beliefs has been identified as the challenges faced with mentor-supported technology professional development in increasing teachers' use of technology in the classroom.

## 7. Recommendations

The study recommended that:

- Mentor-supported model should be used for professional development to enable teachers receive the additional support they need to facilitate change when implementing new strategies.
- Government should ensure adequate provision of relevant technology accessories and infrastructures in all secondary schools in Lagos State so as to encourage mentor-supported training and to enable teacher apply this technology in the classroom.

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