

PROFESSIONAL DEVELOPMENT AS A PREDICTOR OF BASIC TECHNOLOGY TEACHERS' CLASSROOM PRACTICE EFFECTIVENESS IN MINNA METROPOLIS, NIGER STATE

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Abstract:- The study investigated the relationship between basic technology teachers' professional development as a predictor of their classroom practices effectiveness. The study guided by two research questions and one hypothesis was conducted in Minna metropolis, Niger state. The sample size for the study consisted of 198 basic technology specialist teachers. Multi-stage sampling technique was used for the study. Teachers' Self-Assessment Questionnaire on Professional Development and their Classroom Effectiveness (TSQPDCE) was the main instrument used for data collection. TSQPDCE was face and content validated by five experts. TSQPDCE was pilot tested on 17 basic technology specialist teachers in Suleja educational zone in Suleja Local government area of Niger state. The internal consistency for the instrument using Cronbach alpha technique were 0.87 and 0.77 for section A and B respectively. Frequency count and percentage were used to answer research questions and hypothesis was analyzed using Pearson's *r* correlation co-efficient. The study revealed that frequency of participation in available teachers' professional development programmes and basic technology specialist teachers' effectiveness in their classroom practices are low. Hence, it was recommended among others that basic technology specialist teachers should have opportunities for updating their knowledge and skills for enhancing effective performance of their duties.

Keywords:- Teachers' Professional Development, Classroom Effectiveness, Basic Technology

Introduction

Increased attention on the opportunities that professional development (PD) can offer teachers in their classroom practices prompted the education stakeholders such as parents, education practitioners and policy makers among others to see PD as a necessity for teaching profession. For that reason, professional development programmes have vital roles to play in a bid to enhance teachers' classroom effectiveness. Professional development is a process of enhancing the capacity of teachers to be effective and efficient in their ability to accomplish the predetermined objectives of the school system (Canadian Education Association and Simon Fraser University, 2016). In the context of this study, professional development is seen as activities put in place to develop an individual's skills, knowledge, expertise and other characteristics as a teacher for effective and efficient performance of their job. Effective teachers are those who achieve the goals which they set for themselves or which they have set for them by others that is, school administrators, ministries of education, legislators and other government officials (Akpan & Ita, 2015). In this regard, effective teacher must possess and be able to use appropriately the knowledge skills needed for the attainment of these goals. Basic technology teachers' effectiveness (Oviawe, 2016) is viewed as the ability of the teacher to make use of appropriate techniques and strategies to impart in the learners' knowledge, skills and competencies required for bringing about desired positive learning outcomes. Basic science and technology (BST) is a product of four Primary and Junior Secondary School subjects designed to help students: develop interest and acquire basic knowledge and skills in science and technology; applied scientific and technological knowledge and skills to meet contemporary societal needs; take advantages of the numerous career opportunities provided by and become prepared for further studies in science and technology among others (Federal Ministry of Education (2009).

A well trained and dedicated group of basic technology specialist teachers are required to be committed for proper implementation of this subject in a bid to achieve these objectives. Meanwhile, basic science and technology curriculum for Nigerian basic educational system is changing and has been reviewed twice between 2007 up till date to match the test of the time. More so, teaching as a dynamic profession with emerging new knowledge about teaching and learning requires new types of expertise on the part of the teachers. These in turn establish a compelling case for engaging teachers in professional development programmes from time to time. In Nigeria, efforts to improve the quality of teachers' performance by the government in discharging their professional roles include among others the provision for the improvement and regulation of career-long professional development of teachers through the provision of a wide range of programmes and multiple pathways to provide serving teachers with regular opportunities for updating their knowledge and skills (Federal Ministry of Education, 2013). This is a clear-cut policy statement by the Nigerian government establishing the connection between professional development and teachers' effectiveness in discharging their duties. In Niger state, observations have revealed that professional development for basic technology specialist teachers is suffering from some setbacks. The available resources to support teachers' professional development by the state government is not enough to cater for the strong needs for these support. It could also be seen that basic technology specialist teachers' practices in the classroom are not encouraging; their performance appears declining and students' learning seems inadequate as reflected in the performance of these students in most public examinations in recent time. Teachers' ineffectiveness might have responsible for these adverse effects. This study therefore investigates existing relationship between teachers' professional development as predictors of their classroom effectiveness.

Statement of the problem

The potential of the relationship and the link about what professional development can offer to promote teachers' effectiveness is becoming a source of interest to the educational stakeholders. Observations further revealed that teachers also want and need support through professional development programmes to develop and improve their practices so that their students can succeed. In Niger state, observations have revealed that professional development for basic technology specialist teachers is suffering from some setbacks. The available resources to support teachers' professional development by the state government is not enough to cater for the strong needs for these support. It could also be seen that basic technology specialist teachers' practices in the classroom are not encouraging; their performance appears declining and students' learning seems inadequate as reflected in the performance of these students in most public examinations in recent time. Teachers' ineffectiveness might have probably responsible for these adverse effects. The study therefore finds it imperative to investigate the existing relationship between basic technology specialist teachers' professional development as predictors of their classroom effectiveness in Minna metropolis, Niger state.

Research questions

1. What is the frequency of basic technology specialist teachers' participation in the available professional development programmes?
2. How effective are the basic technology specialist teachers' performing in their classroom practices?

Hypothesis

H₀₁: There is no significant relationship between basic technology specialist teachers' participation in professional development programmes and their classroom effectiveness in Minna metropolis.

Methodology

The study adopted descriptive survey of the correlational research design. The design was considered suitable for this study because it avails the researcher the opportunity to establish the relationship that exists between dependent variable that is, teachers' effectiveness in their classroom practices and independent variable that is, teachers' professional development programmes based on the data collected from the respondent using questionnaires. The study was conducted in all the Junior Secondary Schools in the Minna educational zone in Minna metropolis, Niger State. The population for this study comprised of all 235 basic technology teachers in all the Junior Secondary Schools in all the Junior Secondary Schools in the Minna educational zone in Minna metropolis, Niger State.

The teachers' population was obtained from Minna educational zone Schools board in Minna metropolis, Niger State. The sample size for the study consists of 198 basic technology specialist teachers selected across all the schools in the Minna educational zone in Minna metropolis. The population for the study is small and as such all the 198 teachers constitute the sample size for the study. Multi-stage sampling technique was used for the study. Purposive sampling technique was used to select 198 permanent teachers out of the three categories of teachers that is, teachers employed by parents and teachers' association, teachers who are on their National Youth Service Corps and permanent teachers employed by the state government. Secondly, convenience sampling technique was used to select the real respondents for the study.

The instrument used for data collection was a 34-items self-assessment questionnaire titled "Teachers' Self-Assessment Questionnaire on Professional Development and their Classroom Effectiveness" (TSQPDCE). It consisted of sections A and B. Section A consisted of 14 items generated from the literature for the purpose of obtaining information on the frequency of teachers' participation in professional development programmes.

The mode of response consisted of a 5-point likert scale that is, Never = 1; Rarely = 2; Occasionally = 3; Often = 4; and Always = 5. Section B also consisted of 20 items adapted from teacher performance evaluation checklist by Watkins (2016) for obtaining information on teachers' self-assessment on the effectiveness of their practices in the classroom. A 5-point likert-scale was adopted in the mode of response for this section (Not at all true of me = 1; Slightly true of me = 2; Moderately true of me = 3; Very true of me = 4; and Completely true of me = 5). TSQPDCE was face and content validated by five experts, two experts from the department of educational management in University of Ilorin, Ilorin, Kwara state; and three technology education experts from department of science and technology education, University of Lagos, Akoka, Lagos state.

The comments and suggestions of the experts on the suitability, clarity and scope of the content were incorporated in building the final draft of the instrument. TSQPDCE was pilot tested on 17 basic technology teachers in Suleja educational zone in Suleja Local government area of Niger state. The internal consistency for the instrument using Cronbach alpha technique were 0.87 and 0.77 for section A and B respectively. Copies of TSQPDCE were administered and collected through direct approach by the researcher and five research assistants.

Mean and standard deviation were used to answer research questions and the hypothesis was tested using Pearson product moment correlation statistics. The consent of different school principal were sought and obtained to proceed on this study. Each principal solicited the cooperation of basic technology specialist teacher(s) in their respective schools. The researcher and five research assistants administered 192 copies of the questionnaires and 187 copies were later collected or retrieved. Descriptive statistics that is, frequency count and percentage were used to answer research questions while hypothesis was analyzed using Pearson's r correlation co-efficient.

Results

Table 1: Frequency Count and Percentage of Teachers on their Frequency of Participation in Teachers' Professional Development Programmes

S/N	Items	Always		Often		Occasionally		Rarely		Never	
		F	%	F	%	F	%	F	%	F	%
1.	Supervision to Pre-service teachers	10	5.6	21	11.2	5	2.7	46	24.3	105	56.2
2.	In-service education	19	10.1	14	7.5	7	3.5	30	15.5	117	58.9
3.	Capacity Building	12	6.4	33	17.7	24	12.8	41	21.9	87	46.5
4.	Workshops/Conferences/Seminars	12	6.4	33	17.7	24	12.8	41	21.9	87	46.5
5.	Training / Meetings Sessions	16	8.6	37	19.8	23	12.3	44	23.5	67	35.8
6.	Academic study circles	12	6.4	33	17.7	24	12.8	41	21.9	87	46.5
7.	Mentoring	--	--	13	7.0	12	6.4	96	51.3	66	35.3
8.	Book Clubs	9	4.8	16	8.5	18	9.6	33	17.6	111	59.4
9.	Teachers Networking	9	4.8	--	--	9	4.8	33	17.6	136	72.7
10.	Curriculum Design	9	4.8	--	--	9	4.8	33	17.6	136	72.7
11.	Peer assistance and review	16	8.6	37	19.8	23	12.3	44	23.5	67	35.8
12.	Coaching Colleagues	16	8.6	37	19.8	23	12.3	44	23.5	67	35.8
13.	Serving as Team Leader	14	7.5	44	23.5	--	--	17	9.1	102	54.5
14.	Liaison to Community	9	4.8	--	--	9	4.8	33	17.6	136	72.7

Key: F = Frequency count, % = Percent

Table 1 shows that more than 50% of teachers have never participated in professional development programmes nos. 3, 4, 5, 6, 7, 11 and 12; and rarely participated in all the professional development programmes listed except no. 7. It is also indicated in the table that less than 13% of teachers participated occasionally in all the professional development programmes. It was further unveiled in the table that the range of percentage of teachers' often participation in professional development programmes nos. 5, 11, 12, and 13 fell between 19.8% and 23.5 while in other professional development programmes, it fell below 17.8%. More so, the percentage of teachers' who always participated in all the listed professional development programmes fell below 20%.

Table 2: Frequency Count and Percentage of Teachers Self-Assessment on their Classroom Practices Effectiveness

S/N	Items	Completely true of me		Very true of me		Moderately true of me		Slightly true of me		Not at all true of me	
		F	%	F	%	F	%	F	%	F	%
1.	I make class work interesting	23	12.3	17	9.1	53	28.3	89	47.6	5	2.7
2.	I ask questions in class to see if the students understand what has been taught	18	9.6	111	59.4	33	17.6	16	8.5	9	4.8

S/N	Items	Completely true of me		Very true of me		Moderately true of me		Slightly true of me		Not at all true of me	
		F	%	F	%	F	%	F	%	F	%
3.	I give assignments related to the subject we are studying	18	9.6	8	4.3	45	24.1	113	60.4	3	1.6
4.	My students and I discuss and summarize each lesson just studied	15	8.0	16	8.6	22	11.8	134	71.7	--	--
5.	I tell students how they can use what they already have learned to learn new things	23	12.3	17	9.1	53	28.3	89	47.6	5	2.7
6.	I maintain discipline in my classroom	12	6.4	66	35.3	13	7.0	96	51.3	--	--
7.	I return tests and assignments quickly	17	9.1	47	25.1	20	9.8	96	51.3	14	7.1
8.	I give students feedback about their performance	5	2.7	11	5.9	13	6.9	158	84.5	--	--
9.	I am very knowledgeable about the subject(s) I teach	28	14.9	144	77.0	15	8.0	--	--	--	--
10.	I assign homework that helps students in the subject being taught	17	9.1	16	8.6	21	11.2	118	63.1	15	8.0
11.	I prepare worksheets for students to use	21	11.2	40	21.4	25	13.4	89	47.6	12	6.4
12.	I use a variety of classroom activities and resources	29	15.5	57	30.5	65	34.8	19	8.0	19	10.2
13.	I use videotapes for students that help them learn about the subject they are studying	14	7.5	17	9.1	44	23.5	102	54.5	--	--
14.	I tell the class about library/media materials that will help them learn about the subject they are studying when appropriate	16	8.6	21	11.2	17	9.1	118	63.1	--	--
15.	I am well organized	23	12.3	44	23.5	37	19.8	67	35.8	16	8.6
16.	I like it when students ask questions groups depending upon the activity in which they are involved	44	23.5	102	54.5	17	9.1	14	7.5	--	--

S/N	Items	Completely true of me		Very true of me		Moderately true of me		Slightly true of me		Not at all true of me	
		F	%	F	%	F	%	F	%	F	%
17.	I have students work in different	23	12.3	53	28.3	17	9.1	89	47.6	5	2.7
18.	I encourage students to look at problems in new ways and to find new ways to solve problems	5	2.7	11	5.9	13	6.9	158	84.5	--	--
19.	I am available to help students during class time and other times during the day	9	4.8	33	17.7	9	4.8	136	72.7	--	--
20.	I monitor student work, as they are doing it to see if they understand the lesson	14	7.5	17	9.1	44	23.5	102	54.5	--	--

From the data in Table 2, less than 20% of teachers indicated that all the items except item no 16 reflected their "Completely true of me"; less than 35% of teachers indicated that all the items except items nos. 2, 6 and 16 reflected their "Very true of me"; less than 34% of teachers indicated that all the items except item no 12 reflected their "Moderately true of me"; more than 50% of teachers indicated that all the items except items nos. 1, 2, 5, 11, 12, 15, 16 and 17 reflected their "Slightly true of me"; and less than 11% of teachers indicated that all the items reflected their "Not at all true of me".

Table 3: Pearson's r Correlation Coefficient on the Relationship between Teachers' Professional Development Programmes and Teachers' Classroom Practices Effectiveness

		Average of frequency of teachers' participation in professional development programmes	Average teachers' self-assessment on their Classroom Practices effectiveness
Average frequency of teachers' participation in professional development programmes	Pearson Correlation	1	0.893**
	Sig. (2-tailed)		0.000
	N	183	182
Average teachers' assessment on their self-effectiveness	Pearson Correlation	0.893**	1
	Sig. (2-tailed)	.000	
	N	182	182

** Correlation is significant at the 0.01 level (2-tailed).

Table 3 revealed that the strength of the association between frequency of teachers' participation in professional development programmes and their effectiveness in their classroom practices is very high ($r = .893$), and that the correlation coefficient is very highly significantly different from zero ($p < 0.001$). Then, the hypothesis that states that there is no significant relationship between basic technology teachers' participation in professional development programmes and their classroom effectiveness is rejected. This implies that there is a significant relationship between basic technology teachers' participation in professional development programmes and their classroom effectiveness.

Findings and Discussion

It is evident that more than 50% of teachers have never participated in Capacity Building, Workshops/Conferences/Seminars, Training meetings/Training sessions, Academic study circles, Mentoring, Peer assistance and review, and Coaching Colleagues; and rarely participated in all the listed professional development programmes except mentoring and liaison to the community. The results from the findings of the study further reveals that less than 13% of teachers participated occasionally in all the professional development programmes; the least and the highest percentage of teachers' who often participated in capacity building, workshop / seminars / conference, book clubs, teachers' networking and serving as team leader are 19.8% and 23.5% respectively while the frequency of participation in other professional development programmes fell below 17.8%; and the percentage of teachers' who participated in the professional development programmes fell below 20 %.

The findings of the study revealed that large percentage of the respondents never and rarely participated in the available professional development programmes. Premised on these, the frequency of teachers' participation in the available professional development programmes is relatively low. The results of the findings are in line with earlier study by Iyunade (2011) who conducted a study on Teachers' Continuing Professional Development as Correlates of Sustainable Universal Basic Education in Bayelsa State, Nigeria and found that teachers' professional development opportunities are not adequate and sparingly made available especially at the junior secondary school level in the state. The results however contradict Federal Ministry of Education (2013) policy statements that provision of a wide range of programmes and multiple pathways would be made to provide serving teachers with regular opportunities for updating their knowledge and skills; and Oviawe, (2016) who argued that in order to promote the effectiveness of basic technology teachers, they have to be well prepared for their job through professional development programmes. This situation poses serious challenge that should as a matter of urgency be resolved. Hence, serving basic technology teachers would and / or should be availed with regular opportunities for updating their knowledge and skills.

Table 2 also revealed that less than 20% of teachers indicated that all the items except "I like it when students ask questions" reflected their "Completely true of me"; less than 35% of teachers indicated that all the items except "I ask questions in class to see if the students understand what has been taught"; "I maintain discipline in my classroom"; and "I like it when students ask questions", reflected their "Very true of me". More so, less than 34% of teachers indicated that all the items except "I use a variety of classroom activities and resources" reflected their "Moderately true of me"; more than 50% of teachers indicated that all the items except "I make class work interesting"; "I ask questions in class to see if the students understand what has been taught"; "tell students how they can use what they already have learned to learn new things"; "I make materials and worksheets for students to use"; "I use a variety of classroom activities and resources"; "I am well organized; I like it when students ask questions"; and "I have students work in different groups depending upon the activity in which they are involved", reflected their "Slightly true of me"; and less than 11% of teachers indicated that all the items reflected their "Not at all true of me".

The results of the findings indicated that teachers' effectiveness in their classroom practices is relatively low. Oviawe (2016) in a similar study assessed Teachers' Effectiveness as Correlates of Students' Academic Achievement in Basic Technology in Nigeria and found that basic technology teachers' effectiveness in their classroom practices is relatively low. The study therefore recommended that in order to promote effectiveness of basic technology teachers, they have to be well prepared for their job through professional development programmes (Oviawe, 2016). More importantly, the variables, teachers' frequency of participation in professional development and their effectiveness in their classroom practices were tested and it was discovered that teachers' frequency of participation in professional development has positive correlation with the effectiveness in their classroom practices. This implies that these variables tend to increase together that is, increase in frequency of participation in teachers' professional development programmes is associated with increased effectiveness in their classroom practices.

Conclusion

Premised on the results of this study, it could be concluded that a large number of basic technology teachers have not been participating in the available teachers' professional development programmes in Ibadan metropolis, Oyo State. This is a serious lapses that must be urgently addressed. It is the belief of this study that such lapses might have responsible for low teachers' effectiveness as confirmed in the study. The direction of the relationship between the two variables is equally positive, that is, teachers' professional development programmes and the effectiveness in their classroom practices are positively correlated. We can therefore conclude that for basic technology teachers in Ibadan metropolis, there is evidence that their effectiveness is related to professional development. In particular, the study confirmed that the more a basic technology teacher is exposed to professional development programmes, the greater their effectiveness in their classroom practices.

Recommendations

1. Provision should be made by the authority in charge for basic technology specialist teachers to avail them opportunities for updating their knowledge and skills for improvements in the performance of their duties.
2. Policy statements provisions should be implemented in pragmatic sense in Nigeria and not just remain mere statement(s) for the sake of blue print.
3. A yearly induction programmes should be organized for both old and new basic technology teachers. Teachers' participation in such programmes would act as catalytic agent capable of enhancing their effectiveness in classroom practices.
4. School administrators, state teaching service commission and the government should encourage and if possible sponsor basic technology teachers to attend teachers' professional development programmes for updating their knowledge, skills and competence in performing their job as basic technology teachers.

References

- Akpan, C. P. & Ita, A. A. (2015). Teacher professional development and quality Universal Basic Education in Lagos State, Nigeria. *Global Journal of Arts, Humanities and Social Sciences*, 3 (9), 65-76. Available at <http://www.eajournals.org>.
- Amadi, E. C. & Anaemeotu, P. (2013). Professional development on teachers' academic performance in secondary schools in Etche Local Government Area of River State, Nigeria. *International Journal of Education Learning and Development*, 1 (2), 19 - 23. Available at <https://www.researchgate.net/publication/272495717>

- Canadian Education Association and Simon Fraser University (2016). *What is effective teachers' professional development. the facts on education, 2015*. Retrieved on 8th December, 2016 from http://www.cea-ace.ca/sites/cea-ace.ca/files/cea_fone_teacherpd.pdf.
- Federal Ministry of Education (2009). *Junior secondary school curriculum: basic science and technology JSS 1 – 3*. Sheda, Abuja: Nigerian Educational Research and Development Council (NERDC).
- Federal Ministry of Education (2013). *National policy on Education (Revised Ed.)*, Lagos: Federal Ministry of Information.
- Iyunade, O. T. (2011). Teachers' Continuing Professional Development as Correlates of Sustainable Universal Basic Education in Bayelsa State, Nigeria. *African Research Review: An International Multidisciplinary Journal, Ethiopia*, 5 (4), 161- 177. Available at <http://www.ajol.info/index.php/afrrrev/article/viewFile/69274/57303>.
- Oviawe, I. J. (2016). Teachers' effectiveness as correlates of students' academic achievement in basic technology in Nigeria. *International Journal of Academic Research in Progressive Education and Development*, 5 (2), 111 - 119. Available at http://hrmars.com/hrmars_papers/Teachers%E2%80%99.
- Watkins, E. (2016). *Teacher performance evaluation: JPS building tomorrow*. Retrieved on 23rd December, 2016 from <http://www.nctq.org/docs/81-07.pdf>.