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Influence of Teachers' Qualifications in the Teaching of Technical Drawing in Technical Colleges in Edo and Delta States, Nigeria

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Abstract

This study investigated the influence of teachers' qualification in the teaching of technical drawing in technical colleges in Edo and Delta States of Nigeria. One hypothesis was formulated to guide the study: there is no significant difference in teachers' effectiveness between teachers with B. Sc. (Ed) qualification and NCE (Tech.) qualification in the teaching of technical drawing in technical colleges. The study adopted a quantitative descriptive cross-sectional survey research design. Data analysed in this study were the responses of thirty-five (35) technical drawing teachers across ten (10) technical colleges. The selection was done using total sampling technique. T-test was the statistical tool employed to test the hypothesis at 0.05 level of significance. The result of the analysis revealed that teachers with B.Sc. (Ed) qualification have more influence on the students' academic performance when compared with their counterparts who possess NCE (Tech.) qualifications.

Keyword: Teacher Qualification, Teacher Education, Teaching Effectiveness, Teacher Performance

Introduction

Education at secondary school level is the bedrock and the foundation towards higher knowledge in tertiary institutions (Unanma, et al. 2013). Education has been considered as an indispensable instrument for bringing positive change in the social, political, economic and cultural life of people (Nassira, 2016). The quality of education of a nation could be determined by the quality of her teachers (Abe, 2014). Teachers are expected not only to be competent but also to be professional in their related fields and subject-matters (Nassira, 2016).

The teaching qualification is an end product of professional development which encompasses all types of learning undertaken by teachers beyond the point of their initial training (Craft, 2000). Teachers' qualification is a particular skill or type of experience or knowledge someone possesses to make him or her suitable to teach (Aina & Olanipekun,

2015). Maphoso & Mahlo (2015) pointed out one of the major quality of a teacher in their study as; a teacher must possess instructional/intervention skills to maximize the learner's outcomes.

A teacher's qualification refers to all skills required from a teacher to teach effectively, examples of such skills include: formal education, experience, subject matter knowledge, pedagogy studies, duration of training, certificate/licensing and professional development (Zuzovsky, 2009). Teachers' qualifications, is not only the certificate someone is holding as erroneously conceived by some people (Aina and Olanipekun, 2015). Sowder (2007), maintains that the teacher's qualification depends on the professional growth which is noticeable by change in teachers' knowledge, beliefs, and instructional strategies.

Teachers are appointed based on qualification. Their primary duty is to teach, in addition to administrative assignment. Teachers are the catalyst between the learner and the subject matter (Awoyemi, 1986). It is their responsibility to ensure that learning takes place. Stigler and Hiebert (2002) on the other hand, suggest that increased qualification might increase teaching effectiveness. Performance on the job in any profession depends on several factors among which are qualifications. At the primary and secondary levels of education, teaching qualification is a requirement for appointment and progression. Abe (2014) opined that to be a licensed teacher, such a person should have any of these qualifications but not limited to; Postgraduate Diploma in Education (PGDE), The Professional Diploma in Education (PDE), Bachelor of Education (B.Ed) and Nigeria Certificate in Education (NCE). Furthermore, Abe (2014) states that there are three ways in which teacher qualification can be quantified: level of education, years of experience in preparation of subject matter and pedagogy; and certification in their expertise area and their on-going professional development.

Simbo (1985) conducted a correlations study in which he explored, among other things, the influence of academic qualification on teaching effectiveness. Academic qualification was defined in terms of the level of academic training attained. Seventy-seven teachers randomly selected from ten schools in Ilesa and Ile-Ife municipality responded to the instrument titled Teacher Behaviour Questionnaire (TBQ). TBQ, a 33-item instrument was designed to elicit, among other things information on the teachers' academic qualification. A second instrument Teacher Behaviour Description (TBED) was administered to a random sample of 300 students who rated their teachers on a scale of one to five according to how each described the teaching behaviour of those teachers. Teachers' academic qualification was found to have a significant relationship with teaching effectiveness (r = -078).

In the USA, Monk (1994) analyzed data from the 1987 Longitudinal Survey of American Youth that include a national representative study of 10^{th} grader and teachers. Monk found a positive relationship between the number of undergraduate mathematics courses that a teacher completed and student achievement in mathematics, as measured by the National Assessment of Educational Progress in the US. However, a threshold effect was observed, such that the degree of positives influence decreased after five undergraduate mathematics courses. Furthermore, the positive effect from teachers' mathematics coursework occurred for students in advanced high school mathematics courses and not in remedies course. Importantly, teachers' mathematics education course had larger positive effects on achievement than non-education (e.g., liberal arts) mathematics course. Having a majoring mathematics, an advanced degree, or more years of experienced did not affect students' achievement. With regard to science, the number of undergraduate course taken by the teacher in life science had no or negative effects on students' achievement in life sciences.

The relationship between teacher's course and students' achievement in the physical sciences was similar to that found for mathematics.

In October 2001, based on the report by the Abell Foundation in the USA to the effect that are there no credible qualification as regulatory barrier to teaching; the US. Secretary of Education concluded that teacher education does not contribute to teaching quality. This resulted to the setting up of a review commission by the Department of Education. The review analyzed 57 studies published after 1980 to conclude that there is a relationship between teacher education and teaching effectiveness (Wilson et al., 2001). The review showed that the empirical relationship between teacher qualification and student achievement have been found across studies using different units of analysis, different measures of preparation and in studies that employ control for student socio-economic status and prior academic performance.

In another study, Valli and Agnostinelli (1993) described a case study of high school mathematics teachers before and after teacher preparation coursework. Teacher preparation was associated with positive changes in the teachers' use of effective instructional strategies, planning, classroom management and relationships with the students. Grossman (1989) documented the experiences of three high school English teachers who have no formal education teacher education. These individuals had to rely on experiences as students to guide their practice and consequently, they used the strategies of their college English professors. The three teachers lacked pedagogical content knowledge, a framework from which to interpret the difficulties their students encountered. The teachers did not understand the need for planning instead equated planning with knowledge of the subject. They also did not know how to use colleagues as resources. Two of the teachers left teaching.

Adeyeye & Arifolo (1999) also investigated the influence of teachers' professional qualification on academic achievement of students in SSCE chemistry in Ekiti State. One thousand and one hundred and fifty students were randomly selected from thirteen (13) secondary schools by proportionate stratified random sampling techniques. The finding was that a statistically significant difference exists between the academic achievement of students taught by professional and non-professional teachers in chemistry in Ekiti State, Nigeria. Inadequacy of competent teachers was identified as the major problem facing Nigeria education system (Aina & Beecrot, 1982, Aderounmu, 1986). Questions were raised on the relationship between possession of teaching qualification and teaching effectiveness.

This paper therefore is an attempt to appraise technical teachers' effectiveness in the teaching of technical drawing in technical colleges in Edo and Delta States of Nigeria. Technical drawing is one of the major subjects meant to provide the basic concepts needed to enhance the development of technology in Nigeria. Thus, this paper specifically sought to ascertain the influence of teachers' qualifications in the teaching of technical drawing in technical colleges in Edo and Delta States of Nigeria.

Research Question

1. What are the influence of qualification of technical drawing teachers on their effectiveness and the academic achievement of students in technical drawing in technical Colleges in Edo and Delta States?

Hypothesis

$H0_1$: There is no significant difference in teachers' effectiveness between the teachers with B. Sc. (Ed) qualification and NCE (Tech.) qualification in the teaching of technical drawing in technical colleges.

Methodology

The study adopted a quantitative descriptive cross-sectional survey research design. Survey research involves the collection of information from a sample of individuals through their responses to questions (Check and Schutt, 2012). This type of research allows for a variety of methods to recruit participants, collect data, and utilize various methods of instrumentation (Ponto, 2015). Survey research can use quantitative research strategies (e.g., using questionnaires with numerically rated items), qualitative research strategies (e.g., using open-ended questions), or both strategies (i.e., mixed methods). As it is often used to describe and explore human behaviour, surveys are therefore frequently used in social and psychological research (Singleton and Straits, 2009).

Data analysed in this study were the responses of thirty-five (35) technical drawing teachers across the ten (10) old public technical colleges in Edo and Delta States of Nigeria. The new public technical colleges were excluded because of poor infrastructures and human resource development. The selection was done using total sampling technique. The instrument used for collecting data for this study is Teachers' Effectiveness Questionnaire (TEQ). The TEQ was used for classroom teaching observation session for teachers that are actually teaching technical drawing. A mean of 2.5 and above was regarded as 'effective', while a mean below 2.5 was regarded as 'not effective'. T-test was the statistical tool employed to test the hypothesis at 0.05 level of significance.

Discussion of Findings

Table 1 indicates the mean score and the standard deviation of the influence of the B. Sc. (Ed.) technical drawing teachers and the NCE (Tech.) technical drawing teachers on their effectiveness in the teaching of technical drawing. Table 1a shows that the B. Sc. (Ed.) technical drawing teachers had mean score above the 2.50 cut-off point in 10 variables of teachers' effectiveness out of the 18 variables of teachers' effectiveness and they had mean score less than the 2.50 cut-off point in 8 variables of teachers' effectiveness. In other words, the B. Sc. (Ed.) technical drawing teachers were effective in 10 variables of teachers' effectiveness while they were not effective in eight variables of teachers' effectiveness. In the 10 variables where the teachers were effective in the variables of effectiveness, the mean score of technical drawing teachers range from 2.60 to 4.00 while in the eight variables where they were not effective, the mean score of the technical drawing teachers range from 2.10 to 2.40. Also, the same Table indicates that the NCE (Tech.) teachers had mean scores above the 2.50 cut-off point in eight variables of teachers' effectiveness out of 18 variables of teachers' effectiveness and had less than the 2.50 cut-off in 10 variables of teachers' effectiveness. In other words, the NCE (Tech.) technical drawing teachers were effective in eight variables of teachers' effectiveness while they were not effective in 10 variables of teachers' effectiveness. In the eight variables of teachers' effectiveness where the technical drawing teachers were effective the mean score ranges from 2.50 to 3.00, while where they not effective the mean score ranges from 1.00 to 2.40. Table 1A further reveals that 25 out of the 35 technical drawing teachers had B. Sc. (Ed.) qualification while 10 technical drawing teachers had NCE (Tech.) qualification. Also, the overall mean score of 2.90 for the B. Sc. (Ed.)

is above the cut-off point of 2.50 which indicates effectiveness while the overall mean score of 2.30 for the NCE (Tech.) teachers is less than the cut-off point of 2.50 which shows that they were not effective.

Table 1
Mean and standard statistics of the influence of qualification on teachers' effectiveness

S/N	Variable of Teachers' Effectiveness	B. Sc. (Ed.) Qualification n = 25			NCE (Tech.) Qualification n = 10		
		X	SD	Remark	x	SD	Remark
1	Uses of variety of instructional strategies	2.60	0.53	E	2.30	0.47	NE
2	Demonstrates patience, empathy and understanding	2.40	0.49	NE	2.10	0.43	NE
3	Monitors students understanding and re-teaches	3.90	0.80	E	3.00	0.61	E
4	Provides practice and reviews for students	2.40	0.49	NE	2.30	0.47	NE
5	Creates positive classroom environment	4.01	0.82	E	2.60	0.53	E
6	Assist students in discovering and correcting errors and inaccuracy	2.40	0.49	NE	2.20	0.45	NE
7	Teacher stimulates students' interest	2.60	0.53	E	2.40	0.49	NE
8	Uses variety of sensory materials	2.40	0.49	NE	2.00	0.45	NE
9	Uses variety of cognitive levels in strategies of questioning	4.20	0.86	E	2.50	0.51	E
10	Provides opportunities for successful experience by students	2.90	0.59	E	2.52	0.51	E
11	Uses convergent and divergent inquiry strategies	2.20	0.45	NE	2.10	0.43	NE
12	Demonstrates proper listening skills	3.80	0.78	E	2.60	0.53	E
13	Maintains an environment in which students are actively involved	3.40	0.69	E	2.50	0.51	E
14	Encourages students to ask questions	2.90	0.59	E	2.50	0.51	E
15	Provides positive feedback to students on their performance	2.30	0.47	NE	2.20	0.45	NE
16	Develops and demonstrate problem-solving skill	2.25	0.46	NE	2.15	0.44	NE
17	Gives clear directions and explanations	2.10	0.43	NE	1.00	0.20	NE
18	Implements an effective classroom management system for positive behaviour	3.50	0.72	E	2.50	0.51	E
	Overall Mean	2.90	0.59	E	2.30	0.47	NE

Note: E – Effective; NE – Not Effective

Table 2 showed that students taught by technical drawing teachers with B.Sc. (Ed.) qualifications have higher Academic Achievement with a mean score of 50.97 than the students taught by technical drawing teachers with NCE (Tech.) with a means score of 43.16.

Table 2
Mean Score of qualification of technical drawing teachers and academic achievement of their students

Group	Teachers	Students	X
B. Sc. (Ed.)	25	300	50.97
NCE (Tech.)	10	300	43.16

Table 2 showed that students taught by technical drawing teachers with B.Sc. (Ed.) qualifications have higher Academic Achievement with a mean score of 50.97 than the students taught by technical drawing teachers with NCE (Tech.) with a means score of 43.16.

Hypothesis testing of the Influence of Qualification on Teachers' Effectiveness

Table 3 shows the t-test analysis of qualifications on teachers' effectiveness between the B.Sc. (Ed.) and the NCE (Tech.) technical drawing teachers in the teaching of technical drawing in technical colleges. The Table 3 shows five out of 18 variables of teachers' effectiveness indicated a t-test calculated value less than the criterion value of 1.96. Since each of the five variables of teachers' effectiveness has t-test calculated values lower than the criterion value of 1.96. Thus, the null hypothesis is retained. Therefore, there is no significant difference between the B.Sc. (Ed.) qualification and the NCE (Tech.) qualification technical drawing teachers in these five variables of teachers' effectiveness. For each of the other 13 variables of teachers' effectiveness, the t-test calculated value is greater than the criterion value of 1.96. Since each of t-test calculated value is greater than the criterion value of 1.96. Thus, the null hypothesis is rejected. Therefore, there is a significant difference between the B.Sc. qualification and the NCE (Tech.) qualification technical drawing teachers in the 12 variables of teachers' effectiveness in favour of the B Sc. (Ed.).

Table 3
T-test analysis of influence of qualification on teachers' effectiveness

S/N	Variables of Teachers' Effectiveness	Qualification Variables	n	x	SD	df	t-Cal	t-Crit	Remarks
1	Uses of variety of instructional strategies	B. Sc (Ed.)	25	2.60	0.53	33	2.50	1.96	S
		NCE (Tech.)	10	2.30	0.47				
2	Demonstrates patience, empathy and understanding	B. Sc (Ed.)	25	2.40	0.49	33	2.73	1.96	S
		NCE (Tech.)	10	2.10	0.43				
3	Monitors students understanding and re-teaches	B. Sc (Ed.)	25	3.90	0.80	33	5.29	1.96	S
		NCE (Tech.)	10	3.00	0.61				
4	Provides practice and reviews for students	B. Sc (Ed.)	25	2.40	0.49	33	1.11	1.96	NS
		NCE (Tech.)	10	2.30	0.47				
5	Creates positive classroom environment	B. Sc (Ed.)	25	4.01	0.82	33	8.81	1.96	S
		NCE (Tech.)	10	2.60	0.53				
6	Assist students in discovering and correcting errors and inaccuracy	B. Sc (Ed.)	25	2.40	0.49	33	1.82	1.96	NS
		NCE (Tech.)	10	2.20	0.45				
7	Teacher stimulates students' interest	B. Sc (Ed.)	25	2.60	0.53	33	1.67	1.96	NS
		NCE (Tech.)	10	2.40	0.49				
8	Uses variety of sensory materials	B. Sc (Ed.)	25	2.40	0.49	33	3.64	1.96	S

		NCE (Tech.)	10	2.00	0.45				
9	Uses variety of cognitive levels in strategies of questioning	B. Sc (Ed.)	25	4.20	0.86	33	10.00	1.96	S
		NCE (Tech.)	10	2.50	0.51				
10	Provides opportunities for successful experience by students	B. Sc (Ed.)	25	2.90	0.59	33	2.92	1.96	S
		NCE (Tech.)	10	2.52	0.51				
11	Uses convergent and divergent inquiry strategies	B. Sc (Ed.)	25	2.20	0.45	33	9.09	1.96	NS
		NCE (Tech.)	10	2.10	0.43				
12	Demonstrates proper listening skills	B. Sc (Ed.)	25	3.80	0.78	33	7.50	1.96	S
		NCE (Tech.)	10	2.60	0.53				
13	Maintains an environment in which students are actively involved	B. Sc (Ed.)	25	3.40	0.69	33	6.43	1.96	S
		NCE (Tech.)	10	2.50	0.51				
14	Encourages students to ask questions	B. Sc (Ed.)	25	2.90	0.59	33	3.08	1.96	S
		NCE (Tech.)	10	2.50	0.51				
15	Provides positive feedback to students on their performance	B. Sc (Ed.)	25	2.30	0.47	33	0.91	1.96	NS
		NCE (Tech.)	10	2.20	0.45				
16	Develops and demonstrate problem-solving skill	B. Sc (Ed.)	25	2.25	0.46	33	0.91	1.96	NS
		NCE (Tech.)	10	2.15	0.44				
17	Gives clear directions and explanations	B. Sc (Ed.)	25	2.10	0.43	33	13.75	1.96	S
		NCE (Tech.)	10	1.00	0.20				
18	Implements an effective classroom management system for positive behaviour	B. Sc (Ed.)	25	3.50	0.72	33	6.67	1.96	S
		NCE (Tech.)	10	2.50	0.51				

Note: S - Significant; NS – Not Significant

Conclusion

The study showed that teachers with B.Sc. (Ed) qualification have more influence on the students' academic performance when compared with their counterparts who possess NCE (Tech.) qualifications. By implication, teachers with higher academic qualifications are more likely to guide and encourage individual student learning, know how to individualize student learning, how to plan productive lesson and how to diagnose student problems. Teachers with higher educational attainment have an in-depth knowledge of content and how it can be taught effectively for students to learn.

Recommendations

In line with the conclusion, the following recommendations are suggested:

1. The federal and state ministries of education in Edo and Delta States should encourage technical drawing teachers to further their education. This they can support, by granting study leave to teachers. This will have an overall positive multiplier effect on students' performance in technical drawing subject in these technical colleges.
2. Training, re-training/refresher courses and workshops should be organised in the respective technical colleges as this would help update teachers on innovative ways to teach technical drawings.
3. Students' in their examination year, should be taught by the most qualified and experienced teachers as this will no doubt enhance students' academic achievement.

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