
TEACHING SKILLS IN BASIC SCIENCES: IMPLICATION FOR QUALITY TEACHER EDUCATION PROGRAMMES AND LEARNERS' ACQUISITION OF LIFE SKILLS FOR BUILDING A SAFER WORLD

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ABSTRACT

This survey study assessed teachers' teaching skills in basic sciences for quality teacher education programs and learners' acquisition of life skills for building a safer world. A survey research design with expo facto type was used. The sample consisted of 248 sandwich degree science teachers who run their degree program on part-time mode in Oyo State. The data was collected using Sandwich Degree Teachers' Teaching Skills Questionnaire, SDTTSQ ($r=.86$). One research question was formulated and three hypotheses were tested at 0.05 level of significance. Data were analyzed using mean scores, frequency count, percentages and t-test. Results showed that there was no significant difference between male and female science teachers' teaching skills ($t = 0.863$, $df = 246$, $P>.05$). There was a significant difference between private and public school science teachers teaching skills ($t = -2.399$, $df = 246$, $P<.05$). There was no significant difference between urban and rural school science teachers' teaching skills ($t = 0.015$, $df = 246$, $P>.05$). Also, the result showed that science teachers have moderate teaching skills. These results have implications for all categories of teachers undergoing part-time educational programs across institutions of learning, in-service teachers, government, curriculum planners and learners' acquisition of skills for building a safer world.

Word count: 202

Keywords: *Teaching skills, Basic Sciences, Acquisition of skills, Gender, School type, School location, safer world*

INTRODUCTION

Education generally plays a very crucial role in building a safer world through the development of an individual either by formal or informal process. Children are given home education in an informal setting serving as foundation for formal education and also preparing the children for future challenges as the child develops. Through education, the child acquires specific skills which make him a responsible and productive citizen. This then suggests that a child that is not properly educated can turn out to become an irresponsible and unproductive member of the society. Such a child is used for, robbery, and hooliganism, and cultism, terrorism, assaults, burglaries, carjacking, rapes, kidnappings, and extortion purposes among others making the world unsafe as a result of their wicked and cruel activities. As the child passes through stages of his education from pre-primary, through primary and secondary schools to higher education, children develop in the three domains of

achievement-cognitive, psychomotor and affective. Education develops the child all round. Hence, for the world to be peaceful and free from criminal activities, the education giving to the learners must be such that total developments and transformation of the learners is guaranteed.

The process and program of educating a child should move from learning of factual information, writing an examination for the purpose of acquiring certificate to a level of acquiring skills that will make him an independent job creator instead of job seeker. Unfortunately, in most developed countries especially Nigeria, education at lower levels does not portrait the acquisition of skills. But, it is very unfortunate that the situation surrounding the process of educating the child especially in Nigeria is disheartening. The issues of industrial action in schools embarked upon by the teachers, lack of trained teachers, resources including educational resources and infrastructures are all affecting the realization of educational goals on the learners. Children become half baked and begin to use their lives for violence making the world unsafe. The right type of child's education to be received is the sole responsibility of the trained teachers. The origin of any literate or civilized society today to a large extent could be traced to the classroom experience received one time or the other by her citizens under the care of a trained teacher. Hence, the national plan to ensure that a functional education is programmed and approved for every category of individuals either by full-time or part-time modes, Distant Learning or Adult Education programs. All these educational programs are manned by the trained teachers and meant to develop individuals to become a functional member of the society.

Teachers generally and particularly science teachers play important roles in ensuring and guaranteeing the safety of the entire world today through their mentoring expertise. These safety roles could be noticed in the areas of training future professional experts in food production for the masses through agricultural practices, engineering and architectural designs, quality health managements, booming economy, commerce and industry, production of shelter, scientific and technological developments among others. Teachers at all levels of educational pursuits determine the foundation of and climax of national safety and developments. A child that is not properly taught by a professional teacher turns out to become an engineer that will construct bridges that make lives unsafe on the roads, buildings that destroy masses just in one day as they easily collapse; a pharmacist that produces fake drugs that can kill quite a good number of people in one minute, medical doctors that will continue to waste precious lives untimely, economists that will formulate or recommend policies that will make a whole national economy to have a sudden

collapse and people begin to suffer hunger, afflictions and untimely death. The impacts of teachers to ensure that the whole world is safe today are also felt in military training and weapons manufacturing. There could always be casualties through careless handling of wrongly manufactured weapons; there could also be possibility of producing weak and unskillful security personnel that will results into weak security strength and porosity.

On this background, investigating teachers' skills for enhancing their effectiveness and improving on the quality of their instructional performance to produce skilled learners of high qualities for a safer world is worth given attention. National Policy on Education emphasizing the importance of teachers states that no education system can rise beyond the quality of its teachers (FME, 2004, P.33). This implies that no educational system could rise to become an excellent enterprise, weapon of change and safety if teachers possess sub-standard qualities. In recognizing the need to have high quality teachers, FME (2013, P. 56) highlights what should be the goals of Teacher Education which are to:

- i. Produce highly motivated, conscientious and efficient classroom teachers for all levels of the educational system;
- ii. Further encourage the spirit of enquiry and creativity in teachers;
- iii. Help teachers fit into the social life of the community and the society at large and enhance their commitment to national goals;
- iv. Provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to changing situations and
- v. Enhance teachers' commitment to the teaching profession.

Hence, producing highly motivated, conscientious and efficient classroom teachers for all levels of the educational system as pointed out in FME (2013) requires that researches should be conducted to examine the level/extent of teaching skills possessed by the teachers to combat the challenges of insecurity of lives and properties at home and on the streets for building a safer world.

RESEARCH QUESTION

What is the level of sandwich degree science teachers' teaching skills?

HYPOTHESES

1. There is no significant difference between the teaching skills of male and female sandwich degree science teachers
2. There is no significant difference between the teaching skills of private and public school sandwich degree science teachers

3. There is no significant difference between the teaching skills of urban and rural school sandwich degree science teachers

METHODOLOGY

Design

This study was a survey research design of an ex-post-facto type.

Sample and Sampling Techniques

Science teachers who were undergoing their Sandwich Degree program, case study of Emmanuel Alayande College of Education in affiliation with Ekiti State University, were used for the study. The study involved 248 Sandwich Degree science teachers randomly selected from Mathematics, Computer Science, Physics, Chemistry, Biology and Basic Science subject specializations.

Instrument for Data Collection

Sandwich Degree Teachers' Teaching Skills Assessment Questionnaire (SDTTSAQ) was used for the study. This instrument was adapted from Gilmore and Feldon (2010). The instrument was revalidated and the reliability determined using cronbach alpha method. A reliability index of 0.86 was obtained. The instrument had two sections –A and B. Section A deals with the personal data of the Sandwich Degree science teachers including gender, area of specialization, school location and school type. Section B deals with the teaching skills. This questionnaire of fourteen (14) items sets out to assess the respondents' teaching skills. The items were placed on a four point likert scale and assigned weights as follows: For positive statements, Strongly Agree (SA) = 4, Agree (A) =3, Disagree (D) =2, Strongly Disagree (SD) =1. For negative statements: SD=4, D=3, A=2, SA=1.

Procedure for Data Collection

Classes of the respondents involved in the study were visited by the researcher and the questionnaire was administered by providing a copy of the instrument to each of the Sandwich Degree Science teachers.

DATA ANALYSIS RESULTS

Demographic variables:

Table 1 Distribution of the respondents by Gender

Gender	Frequency	Percentage (%)
Male	73	29.4
Female	175	70.6
Total	248	100.0

Table 1 shows that 73 (29.4%) of the respondents were males, while the remaining 175 (70.6%) were females.

Table 2 Distribution of the respondents by School Type

School type	Frequency	Percentage (%)
Private	103	41.5
Public	145	58.5
Total	248	100.0

Table 2 shows that 103 (41.5%) of the respondents were in private schools, while the remaining 145 (58.5%) were teachers in public schools.

Table 3 Distribution of the respondents by School Location

School location	Frequency	Percentage (%)
Urban	182	73.5
Rural	66	26.6
Total	248	100.0

Table 3 shows that 182 (73.5%) of the respondents were in urban schools, while the remaining 66 (26.6%) were teachers in rural schools.

Research Question 2: What is the level of science teachers' teaching skills?

Table 5: Level of Science teachers' teaching skills

S/No	Items	NAP	NAB	WAB	MAB	SAB	EAB	Mean	STD.D
1	Ability to plan for instruction	-	2 0.8%	14 5.6%	109 44.0%	101 40.7%	22 8.9%	4.51	0.769
2	Ability to structure a productive learning	2 0.8%	2 0.8%	15 6.0%	96 38.7%	111 44.8%	22 8.9%	4.52	0.834

Teaching Skills in Basic Sciences: Implication for Quality Teacher Education Programmes and Learners' Acquisition of Life Skills for Building a Safer World

3	Ability to engage students in learning	2 0.8%	2 0.8%	9 3.6%	70 28.2%	132 53.2%	33 13.3%	4.72	0.829
4	Ability to develop relationships with students	3 1.2%	2 0.8%	10 4.0%	58 23.4%	125 50.4%	50 20.2%	4.81	0.912
5	Ability to provide clear explanations and examples	2 0.8%	3 1.2%	4 1.6%	93 37.5%	94 37.9%	52 21.0%	4.73	0.905
6	Ability to make connections with other discipline or real world phenomenon	4 1.6%	4 1.6%	18 7.3%	116 46.8%	91 36.7%	15 6.0%	4.33	0.884
7	Ability to facilitate student investigation	- -	9 3.6%	21 8.5%	91 36.7%	105 42.3%	22 8.9%	4.44	0.902
8	Ability to encourage multiple problem solving approaches	4 1.6%	3 1.2%	19 7.7%	95 38.3%	97 39.1%	30 12.1%	4.48	0.956
9	Ability to promote strong conceptual understanding	- -	6 2.4%	23 9.35	103 41.5%	91 36.7%	25 10.1%	4.43	0.883
10	Ability to identify student misconceptions	4 1.6%	12 4.85	15 6.0%	87 35.1%	110 44.4%	20 8.1%	4.40	1.005
12	Ability to adjust instructions to meet students' needs	- -	6 2.4%	15 6.0%	80 32.35	127 51.1%	20 8.1%	4.56	0.822
13	Ability to evaluate the effectiveness of instruction	2 0.8%	2 0.8%	4 1.6%	86 34.7%	124 50.0%	30 12.1%	4.68	0.798
14	Time management	2 0.8%	2 0.8%	7 2.8%	75 30.2%	119 48.0%	43 17.3%	4.76	0.857
15	Knowledge of subject area	2 0.85	- -	5 2.0%	101 48.7%	88 35.5%	52 21.0%	4.73	0.870
Weighted mean = 4.58									

Table 5 shows the level of science teachers' teaching skills. The rating is as follows: Ability to develop relationships with students (mean = 4.81) was ranked highest in

the mean score rating and was followed by Time management (mean = 4.76), Knowledge of subject area (mean = 4.73), Ability to provide clear explanations and examples (mean = 4.73), Ability to engage students in learning (mean = 4.72), Ability to evaluate the effectiveness of instruction (mean = 4.68), Ability to adjust instructions to meet students' needs (mean = 4.56), Ability to structure a productive learning (mean = 4.52), Ability to plan for instruction (mean = 4.51), Ability to encourage multiple problem solving approaches (mean = 4.48), Ability to facilitate student investigation (mean = 4.44), Ability to promote strong conceptual understanding (mean = 4.43), Ability to make connections with other discipline or real world phenomenon (mean = 4.33) and lastly by Ability to identify student misconceptions (mean = 4.40). Table 5 further revealed the weighted mean score of 4.58 out of the maximum 6.00, which is higher than the standard mean of 3.50. This implies that the teachers have moderate teaching skills.

Hypothesis 1

There is no significant difference between the teaching skills of male and female science teachers

Table 7: Difference between male and female science teachers' teaching skills

Gender	N	Mean.	Std.d	Df	T	P value	Remark
Male	73	64.78	6.905	246	0.863	0.389	N.S
Female	175	63.86	7.916				

Table 7 shown that there was no significant difference between male and female science teachers' teaching skills ($t = 0.863$, $df = 246$, $P > .05$). Table 7 further revealed that male teachers had the highest teaching skills mean score (64.78) while their female counterparts had the least mean score (63.86). But, this difference in their mean scores is not statistically significant.

Hence, the null hypothesis 1b was not rejected.

Hypothesis 2: There is no significant difference between private and public school science Teachers' teaching skills

Table 9: Difference between private and public school teachers' teaching skills

School type	N	Mean.	Std.d	df	T	P value	Remark
Private	103	62.77	7.946	246	-2.399	0.027	Sig.
Public	145	65.10	7.269				

Denotes significant at $P < .05$

Table 9 shows that there is a significant difference between private and public school science teachers teaching skills ($t = -2.399$, $df = 246$, $P < .05$). Table 9 further showed that public school science teachers had the highest teaching skills mean score (65.10) while their private school counterparts had the least mean score (62.77). Thus, this difference in their mean scores is statistically significant. This implies that public school science teachers had better teaching skills than their private school science teacher's counterparts. Hence, the null hypothesis 2b was rejected

Hypothesis 3: There is no significant difference between urban and rural school science teachers' teaching skills

Table 11: Difference between Urban and Rural school science Teachers Teaching Skills

School location	N	Mean.	Std.d	df	T	P value	Remark
Urban	182	64.14	7.656	246	0.015	0.988	N.S
Rural	66	64.12	7.615				

Table 11 shows that there is no significant difference between urban and rural school science teachers' teaching skills ($t = 0.015$, $df = 246$, $P > .05$). Table 11 further revealed that urban school science teachers had the highest teaching skills mean score (64.14) while their rural counterparts had the least mean score (64.12). But, this difference in their mean scores is not statistically Significant. Hence, the null hypothesis 3b was not rejected.

DISCUSSION AND IMPLICATIONS OF THE RESULT

Results showed that there was no significant difference between male and female science teachers' teaching skills ($t = 0.863$, $df = 246$, $P > .05$). The result of this study could be because both male and female Sandwich Degree science teachers are exposed to the same professional training which is meant for them to acquire professional knowledge, skills and pedagogy. Cook and Cook (2014) submitted that in most areas of assessment, male and female respondents show more similar result output than it is noticed in their differences. The result also revealed that there was a significant difference between private and public school science teachers teaching skills ($t = -2.399$, $df = 246$, $P < .05$). Public school science teachers had better teaching skills than their private school science teachers' counterparts. There was no significant difference between urban and rural school science teachers' teaching skills ($t = 0.015$, $df = 246$, $P > .05$). Also, the result revealed that Sandwich Degree science teachers have moderate teaching skills. The society and the children are becoming more complex and this call for teachers to improve on the appropriate teaching skills beyond an average level to a high level that their teaching expertise will be enhanced

to face the challenges of the modern times and benefit the learners and the society at large.

The developed nations of the world today are growing at an exponential rate in science and technology. Also, the developing nations crave for scientific and technological breakthroughs. The more the scientific and technological advancements, the more is the rate of criminal activities and the more the increase in crime rate, the more the whole world becomes unsafe. Teachers play prominent roles in building a safer world. The result of this study reveals both male and female teachers have moderate skills. The complexity of the world system in the modern time requires highly skilled and efficient teachers who will teach for skill acquisition not teaching only for memorization of facts for the purpose of writing examinations. In Nigerian society, learners during instructional process are always conscious of factual information that will earn them better scores in written examinations. They are fully aware of getting the certificate so that they are employed in their later lives. This implies that failure in written examinations makes it difficult for them to cope with life challenges since little or no particular skills are acquired during their school days to survive the trauma. Curriculum should place more emphasis on learners' skills acquisition. When learners acquire the needed skills, they become independent and self-reliant. They become job creator instead of job seekers. They are most likely to contribute meaningfully to the world around them. They are equipped with meaningful endeavours.

Conversely, unskilled youths though may have 'big certificates' are likely to involve in hooliganism, cultism, alcoholism, drug addiction, armed robbery, kidnapping and 'area boys' activities. Such category of youths becomes a threat to the peace and security of the world around them because they are half-baked from schools. Uzochukw (2017) lamented that one major problem facing education enterprise in Africa is that it does not really promote acquisition of skills on the part of the students. This implies that failure of the government or private organizations to employ the youths will increase the rate of unemployment among the youths. As the rate of unemployment increases, criminal manipulations permeate the society to make the world unsafe. Herein are the essential roles of the teachers in building a safer world. Teaching for students to acquire and practice the needed skills they have learnt in real life situation makes them inventors and peace promoters. Male and female teachers in public and private schools, urban and rural areas need to put more efforts to attend conferences and in-service trainings to upgrade and update their professional skills. This will help them to produce skilled learners of high quality for building a safer world.

RECOMMENDATIONS

Based on the findings of this study, the researchers make the following recommendations:

1. Science teachers should put more effort to acquire and improve their basic teaching skills to produce skilled learners of high quality for building a safer world.
2. The curriculum for Part-time educational programs such as Sandwich Degree, Postgraduate Diploma in Education, Nigerian College of Education (part-time) among others, should be tailored towards candidates acquiring necessary instructional/teaching skills. It is not only for students to acquire 'big' certificates but also equipping the would-be teachers or in-service teachers with the skills to face the challenge of teaching-learning processes for building a safer world.
3. Government should put more effort in the areas of training and retraining of all categories of teachers to enhance skills' acquisition for building a safer world.
4. Teachers should endeavour to attend seminars, workshops and conferences to share ideas with other colleagues in the same field to improve on their skills essentially for producing highly self-actualized learners for building a safer world.
5. Teachers should gear more efforts to go for higher degrees to acquire more professionalism and 'mental transformations'.

CONCLUSION

This study was conducted to investigate teaching skills in basic sciences which has implication for quality teacher education programs and learners' acquisition of life skills for building a safer world. The skills assessed in this survey are: ability to plan for instruction, ability to structure a productive learning, ability to engage students in learning, ability to develop relationships with students, ability to provide clear explanations and examples, ability to make connections with other discipline or real world phenomenon, ability to facilitate students' investigation, ability to encourage multiple problem solving approaches, ability to promote strong conceptual understanding, ability to identify student misconceptions, ability to adjust instructions to meet students' needs, ability to evaluate the effectiveness of instruction, time management and knowledge of subject area. When teacher improves on these skills, it is hoped that the reciprocal effect will be to produce learners with functional life skills for building a safer world.

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