

**PHYSICS TEACHERS PERCEPTION ON THE RELEVANCE OF THEIR UNIVERSITY
TEACHER TRAINING PROGRAMME IN TEACHING OF PHYSICS CONTENTS IN
SECONDARY SCHOOLS IN ANAMBRA STATE**

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Abstract

The study determined the physics teachers' perception on the relevance of physics contents of university teachers training programme in teaching of physics contents in secondary schools in Anambra State. The study adopted a descriptive survey research design, guided by thr8ee research questions. The entire population of this study 156 physics teachers in Anambra State (male: 79 and female: 77) in the 261 secondary schools in Anambra State was used without sampling. This is because the population was considered small and not all the schools have physics teachers. The instrument for the study was Teachers Perception on the Relevance of Physics Contents of their Training Program Questionnaire (TPRPCTPQ) adopted from Buabeng, Conner and winter (2016) and modified to suit the present study. The instrument was subjected to face validitation. The instrument was given to experts in measurement and evaluation from Nnamdi Azikiwe University, one science education lecturer from Nnamdi Azikiwe University. The internal consistency of the instrument was determined using conbranch's alpha. The coefficient of 0.74 was obtained. Data collected was analyzed using mean and standard deviation. The findings of result show among others that Physics teachers in secondary schools in Anambra state have a very high relevance perception on the use of physics contents of university teachers training programme in teaching of physics contents in secondary schools in Anambra State and that Greater percentage of physics teachers in secondary schools in Anambra state are not professionally trained as physics educationalist. Based on the findings, it was recommended among others that Physics lecturers in Universities should continue to implement the Benchmark Minimum Academic Standard for undergraduate physics programme in Nigeria universities curriculum planned effectively since it is of very high relevance to the teaching of physics contents in secondary school.

Key words: Physics contents, Physics teachers, physics education programme

Introduction

Education has been an instrument of transformation. It is a matchless asset of fundamental importance to man and his environment. According to Okeke in Obialor (2022) education is defined as the art of making available to each generation the organized knowledge of the past. The author continued that education embraced not only direct knowledge from schools and colleges but also the development of character. In the same view, the importance of the teachers and the process of their making cannot be overlooked in education.

Teacher education is a program that trains men and women to become professional teachers. Teacher education is a form of formal education which prepares people to become qualified teachers Okeke in Obialor (2022). Teacher education is the component of any educational system charged with the education and training of teachers to acquire the competences and skills of teaching for the improvement in the quality of teachers for the school system (Onyema, Igwe&Ogadi 2018). In Nigeria educational system, especially at the university level, teachers' education program is designed to provide the teachers with the intellectual and professional background adequate for their assignments and make adaptable to changing situation (National Policy on Education (NPE), 2013).

Faculty of education in Nigeria universities therefore, is expected to produce prospective teachers with proper leadership qualities, knowledge, attitudes and enhance the skills of teachers in the use of new technologies (National University Commission (NUC), 2007). Each university is allowed to decide the title of the degree to be awarded in its faculty of education. The following variety of degrees are in operation and available in faculty of education of the Universities in Nigeria: B.Ed. in Integrated subjects; B.Ed. in Specialist Education Areas; B. Ed. (Ed.) Arts and Humanities related program; B.Sc. (Ed) science related program; B. Sc. Ed Social Sciences related Program; B. L. S. /B.A (L.S)/B.Sc. (L.S) Library Science, B. Sc. Ed (LIS/RM)(NUC, 2018). Physics education which is the interest of this study can be seen as part of degree under B.Sc. (Ed) Science related program.

Physics education programme is one of the programmes studied in Nigeria universities and it is made to specifically prepare professional physics teachers who are to teach at the secondary school level. In Nigeria University, this program involves months of teaching practice in the secondary school which is the practical aspect of the pre-service training. However, the following are the courses contained in the bench mark minimum academic standard for physics students teachers' in Nigeria universities; mechanics, heat, light, sound, laboratory physics, electricity & magnetism, properties of matter, general mathematics, thermal physics, electric circuit & electronics, atomic physics, classical mechanics, electromagnetic field, wave, nuclear physics, energy physics, electrodynamics, solid state physics, quantum physics, experimental technique, environmental physics and material. McDermott and Shaffer (2000) recommended that teachers should study each topic in a way that is consistent with how they are expected to teach that material, so they can experience effective models for learning that particular content.

Physics as a subject in senior secondary program is one of the core science subjects established by National Educational Research and Development Council (NERDC). Physics involves every attempt of humans to explore, interpret and manage the natural world. Physics is the most basic and fundamental natural science which involves universal laws and the study of the behavior and relationships among a wide range of important physical phenomena (Cutnell & Johnson, 2007). Physics encompasses the study of the universe from the largest galaxies to the smallest subatomic particles. Physics is the basis of many other sciences, including chemistry, oceanography, seismology, astronomy and physicists may work in many fields including the health services, communications, education and meteorology's (American Physics Society, 2008; Gibbs, 2003). Despite the importance of physics to the nation's development, the students' performance in physics at both internal and external examination has remained persistently poor. For instance, Inyang and Josiah (2018) reported that the West African Examination Council (WAEC) results of physics students from 2010 to 2016 were poor. In line with this, Badmus & Omesewo in Oluwatoyin (2020) showed that students perform poorly in physics in external examination. Similarly, research performance of physics students at the tertiary level points to the fact that the students did not acquire the requisite knowledge and skills expected of them at the lower (secondary) level of education system (Meckonnen, 2014). This could be one of the reasons the number of students admitted in the tertiary institution to study physics remain the least compared to other sciences including Biology, Chemistry and Mathematics (Agommuoh, 2014). Many researchers have identified many factors as being responsible for the poor performance of students in physics without looking at the physics teachers' perception on the relevance of their university teacher training programme in teaching of physics contents in secondary schools in Anambra state. It is on this ground that the researchers carried out this study in order to ascertain the physics teachers' perception on the relevance of their training program to teaching of physics contents in secondary schools in Anambra State.

Purpose of the Study

The purpose of the study is to determine the perception of physics teachers on the relevance of their university teachers training program in teaching of physics contents in secondary school in Anambra state. Specifically, the study sought to find out;

1. Physics teachers' perception on the relevance of their university teachers training program in teaching of physics contents in secondary schools.
2. Physics teachers' perception on the relevance of their university teacher training program in teaching of physics contents in secondary schools based on their qualification.

Research Questions

The following research questions guided the study

1. What is the perception of the physics teachers on the relevance of their university teachers training program in teaching of physics contents in secondary schools?
2. What is the Physics teachers' perception on the relevance of their university teacher training program in teaching of physics contents in secondary schools based on their qualification?

Methods

The descriptive survey research design was adopted in the study. According to Nworgu (2015), descriptive survey design is those studies which aim at collecting data and describing in a systematic manner the characteristics feature or facts about a given population. The study was carried out in secondary schools in Anambra State. The population of the study consisted of the entire 1256 physics teachers in Anambra State (male: 79 and female: 77) in the 261 secondary schools in Anambra state. The entire population was used without sampling. This is because the population was small and not all the schools have physics teachers. The instrument for the study was Teachers Perception on the Relevance of Physics Contents of their Training Program Questionnaire (TPRPCTPQ) was adopted from Buabeng, Conner and Winter (2016) and modified to suit the present study. The instrument consisted of teachers' demographic information, physics teachers program drawn from National University Commission (NUC) and Senior School Physics Curriculum drawn from Nigeria Educational Research and Development Council (NERDC). The items drawn from NUC and NERDC were on 4 points Likert-type scale of Very High Relevance (VHR) High Relevance (HR), Low Relevance (LR) and Very Low Relevance (VLR) to be rated 4, 3, 2 and 1 respectively. The questionnaire was of two (2) parts; A and B. Part A was on the demographic information of the teachers, part B was 20 items based on the NUC program for physics education and NERDC which checked physics teachers' perception on the relevance of their teachers training physics contents for teaching secondary physics. The instrument was subjected to face validity. The instrument was given to experts to validate. They experts were asked to validate the instrument in terms of clarity, relevance, and substance-ability. Comment and corrections made by the validators were affected by the researcher in the final copy of the instrument. In order to established the reliability of the instrument. The TPRPCTPQ was administered to 10 physics teachers different from those of the research area. The questionnaire was answered and was returned to the researchers. The internal consistency of the instrument was determined using the Cronbach's alpha. The coefficient of 0.74 was obtained. However, a total of 156 questionnaires were given out to the 156 physics teachers of the various schools in the educational zones, through the help of the principals, guidance and concealing unit and the HOD of the science department, 122 questionnaires were returned back. This was because some schools do not have physics teachers and some of the physics teachers have retired. The information collected using the TPRPCTPQ was used for the data analysis. Mean, standard deviation and percentage were used to answer the research questions. In answering the research questions, mean scores that fall between 4.00-3.50, 3.49-2.50, 2.49-1.50 and 1.49 below were taken to indicate VHR, HR, LR and VLR respectively.

Results

Research Question One: What is the perception of the physics teachers on the relevance of physics contents of university teachers training programme in teaching of physics content in secondary schools?

Table 1: Mean rating on perception of the physics teachers on the relevance of their university teachers training programme in teaching of physics in secondary school

| S/N | Items | Mean | Std. Deviation | REMARK |
|-----|---|------|----------------|--------|
| 1 | My knowledge of classical mechanics help me to teach translational motion, conservation and mechanics in secondary school physics | 4.25 | 0.846 | VHR |
| 2 | My knowledge of radiation, nuclear energy, nuclear reaction and atomic structure help me to teach nuclear physics in secondary. | 4.02 | 0.853 | VHR |
| 3 | My knowledge of solid state physics in the university helps me to teach crystals structure in my class room. | 3.97 | 0.927 | VHR |
| 4 | My knowledge of material science in the university helps me to teach crystals structure in class room. | 3.77 | 1.027 | VHR |
| 5 | In teaching of quantization energy, I find the knowledge of quantum mechanics of the university useful in the class room. | 3.75 | 0.992 | VHR |
| 6 | When I want to teach basic electronics in the class room, I find electronics knowledge I gained in the university useful. | 3.85 | 0.951 | VHR |
| 7 | My knowledge of mathematics I gained in the university is relevant when I am teaching derivation of projectile and linear equation to my students | 4.27 | 0.909 | VHR |
| 88 | My knowledge in material science in university is relevant when I am teaching x- ray under nuclear physics in secondary school | 3.59 | 1.018 | VHR |
| 9 | In solving mathematical problems, I find my knowledge of general mathematics of the university useful in secondary school physics classroom. | 4.35 | 0.908 | VHR |
| 10 | I use my knowledge of electricity to teach electric field lines of forces, static and current electricity in secondary school physics. | 4.30 | 0.890 | VHR |

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|----|---|-------------|--------------|------------|
| 11 | When teaching magnetic field, I find my knowledge of magnetism in the university useful in the class room. | 4.16 | 0.894 | VHR |
| 12 | My knowledge of atomic physics in the university is useful in the teaching of atomic models in secondary physics. | 4.07 | 0.892 | VHR |
| 13 | In teaching heat and temperature in secondary school, I find the knowledge of thermal physics I gained in the university useful. | 4.20 | 0.933 | VHR |
| 14 | During experimental physics on verification of Hooks law and simple pendulum, I find my knowledge of mechanics very relevant in carrying out the experiment. | 4.52 | 0.730 | VHR |
| 15 | When teaching heat in secondary school, I find the knowledge I gained from the university thermal physics useful. | 4.16 | 0.971 | VHR |
| 16 | During experiments on light, I use my knowledge of optics in the lab. | 4.10 | 1.071 | VHR |
| 17 | My knowledge of physical quantities in university is relevant to teaching of fundamentals and derived quantities in secondary school physics | 4.34 | 0.860 | VHR |
| 18 | In teaching wave in secondary school, I find the knowledge of quantum physics I gained in the university useful. | 4.00 | 0.971 | VHR |
| 19 | The knowledge gained from electrodynamics in the university is relevant in teaching of electromagnetic spectrum and electromagnetic induction in secondary school physics | 3.84 | 0.936 | VHR |
| 20 | The knowledge of environmental physics I gained in the university is useful in the teaching of the solar system in secondary school physics. | 3.71 | 0.992 | VHR |
| | Grand mean | 4.06 | 0.244 | VHR |

The result in Table 1 shows the perception of the physics teachers on the relevance of their university teachers training programme in teaching of physics contents in secondary school. All the items had mean rating above 4.00- 3.50. The grand mean 4.06 also falls within 4.00- 3.50 above indicating a very high relevance of physics contents of university teachers training programme in teaching of physics content in secondary schools in Anambra State. The trend in their mean indicates that all the physics teachers in secondary schools do not have equal view/opinion on the relevance of the university physics contents for teachers training programme.

Research Question Two: What is the Physics teachers' perception on the relevance of physics contents of university teacher training programme in teaching of physics content in secondary schools based on their qualification?

Table 3: Mean rating on physics teachers perception on the relevance of their university teachers training programme in teaching of physics content in secondary schools based on their qualification

| Qualification | Frequency | Mean | SD |
|--------------------|------------|--------------|--------------|
| B.Sc. Ed (Physics) | 31 | 4.04 | 0.881 |
| B.Sc. (Physics) | 30 | 4.09 | 0.893 |
| B. Eng | 35 | 4.12 | 0.938 |
| M.Sc .Ed (Physics) | 19 | 3.98 | 1.019 |
| M.Sc. Eng | 4 | 4.06 | 0.718 |
| Ph.D | 3 | 3.98 | 0.722 |
| Total | 122 | 24.27 | 5.171 |

The result from Table 6 showed the mean rating for teacher qualification: B.Sc. Ed (Physics) is 4.04, (SD=0.8881), B.Sc. (Physics) is 4.09(SD=0.893), B.Eng is 4.12, (SD=0.938), M.Sc. Ed is 3.98, (SD=1.019), M.Sc Eng. Is 4.06, (SD=0.718), Ph.D is 3.98, (SD=0.722). This indicates that more of the physics teachers with B. Eng. perceived physics contents of university teacher -training programme of very high relevant than physics teachers with B.Sc.Ed, B.Sc, M.Sc Ed, M.Sc. Eng, and Ph.D in teaching of physics content in secondary schools. This also indicates that most persons who study engineering ends up as teachers in the class room.

Discussion of the findings

The findings of the result in table 1 revealed that the physics teachers perceived the university physics contents of the teachers training programme to be very high relevance in teaching of physics in secondary school. The result also showed that the teachers of physics do not have equal view/opinion on the relevance of the university physics contents for teachers training programme. This agrees with the findings of Buabeng, Conner and Winter (2016) who noted that physics teachers have varying degree of need in order to be effective in the content they

teach. However, the findings of this study is in contrast to Omoseyo (2009) who reported that teachers that taught physics at the senior secondary school level could not teach some topics well because they were not taught well while in the college/university.

In terms of physics teachers perception on the university physics contents relevance in teaching of physics contents in secondary school based on their qualification. The findings of the result revealed that more of the physics teachers with B. Eng. perceived physics contents of university teacher -training program of very high relevant than physics teachers with B.Sc.Ed, B.Sc, M.Sc. Ed, M.Sc. Eng, and Ph.D in teaching of physics contents in secondary schools. This also indicates that most persons who study engineering ends up as teachers in the class room. This could be that the number of persons that enroll into physics as a teaching course is low. This is in line with the findings of Omoseyo (2009) who stated that the number of physics teachers is not as desired in Nigerian secondary schools and that many schools do not have physics teachers. This lack of physics teachers is very obvious in Anambra state where the study was carried out. Among the reason for this lack of physics teachers could be that students' perceived it as hard and abstract subject because no qualify teacher to handle it. In view of the above, Omoseyo (2009) also recommended that scholarship should be granted to candidates willing to read physics education in the university and also that there should be in-service training for those on the job.

CONCLUSION

From the findings of the study, the following conclusions were drawn

1. Physics teachers in secondary schools in Anambra state, have a very high relevance perception on the use of physics contents of university teachers training programme in teaching of physics content in secondary schools in Anambra State.
2. Greater percentage of physics teachers in secondary schools in Anambra state are not professionally trained as physics educationalist

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Physics lecturers in Universities should continue to implement the Benchmark Minimum Academic Standard for undergraduate physics programme in Nigeria universities curriculum planned effectively since is of very high relevance to the teaching of secondary school physics.
2. Secondary Educational Management Board should ensure that all the physics teachers in secondary schools in Anambra state are professionally trained as physics educationalist

REFERENCES

- Agommuah, P.C. (2014). *Nigeria integrated science curriculum* – Teacher.co.ke
- American Physics Society. (2008). Why study physics? Retrieved May 25, 2013, from <http://www.aps.org/programs/education/whystudy.cfm>.
- Barroughs, (2019). A review of literature on teachers' effectiveness and students outcome. *IEA Research for education, (IEAR vol 6)*
- Buabeng, I., Conner, L., & Winter, D. (2016). Physics Teachers' Views on their Initial Teacher Education. *Australian Journal of Teacher Education, 41(7)*.
- Cutnell, J. D., & Johnson, K. W. (2007). *Physics (7th ed.)*. New Jersey: John Willey & Sons Inc.2
- Federal Republic of Nigeria (2013). *Nigerian National Policy on Education (Revised)*. Yaba Lagos, NERDC.
- Gibbs, K. (2003). *Advanced physics (2nd Ed.)*. Cambridge, United Kingdom: Cambridge University press.
- Iyang, O. G. & Josiah, S. O. (2018). User's perception of librarians knowledge management strategies. *The leajon: Academic journal of interdisciplinary studies. vol-9, issue1*.
- Mekonnen, S. (2014). *Problems challenging the academic performance of physics students in higher government institutions in the case of arbaminch.wolayitasodo, hawassa and dilla universities*.
- McDermott, C. L., & Shaffer, P. S. (2000). Preparing teachers to teach physics and physical science by inquiry. *Physics Education, 35(6), 411-416*.
- National Universities Commission, (2007). *Benchmark Minimum Academic Standard for Undergraduate Programmes in Nigerian Universities Education*. Abuja Nigeria. <https://edu.ng>

Nworgu, B.G (2015). *Educational research. Basic issue & methodology(3rded)*.Nsukka: University Trust Publishers.

Obialor, C. O (2022). *Evaluation of implementation of minimum standard for Nigeria Certificate in Education biology curriculum in College of Education in Nigeria*. Unpublished Doctoral Dissertation, Department of Science Education, Nnamdi Azikiwe University, Awka.

Omobe, S. E. (2015). The crisis of education in Nigeria.*Internal journal of humanities, social sciences and education (JJHSSE)*, 2:12, 1- 8.

Omoseyo, E.O. (2009). Physics Teachers Utilization of University Teachers Training Program in Teaching physics in Secondary School *.An International Multi-Disciplinary Journal of African Research Review*. 3(1), 314-325.

