British Journal of Education

Vol.6, No.11, pp.52-64, November 2018

Published by European Centre for Research Training and Development UK (www.eajournals.org)

COMPLIANCE LEVEL WITH PROFESSIONAL KNOWLEDGE AND SKILLS REQUIREMENTS BY HIGH SCHOOL PHYSICS TEACHERS IN AKWA IBOM STATE: IMPLICATIONS FOR THE EDUCATION OF SCIENCE TEACHERS

Dr. John T. Mkpanang
Department of Science Education
University of Uyo, Akwa Ibom State, Nigeria

Dr. UtibeAbasi S. Stephen
Department of Science Education
University of Uyo, Akwa Ibom State, Nigeria

ABSTRACT: *The study examined the compliance level with professional knowledge and skills requirements in the professional standards for Nigerian teachers (PSNT) by secondary school physics teachers in Akwa Ibom State of Nigeria. The study adopted a descriptive survey design. The population of this study comprised all physics teachers in all public secondary schools in the three senatorial districts of the State. The sample for the study comprised one hundred and twenty physics teachers that satisfied the purposive sampling technique criteria as spelt out. The researchers made use of an adapted checklist tagged "Physics Teachers Knowledge and Skills Checklist" (PTKSC) to ascertain the professional standing of the selected teachers in two subthemes (professional knowledge and professional skills) out of the four themes in the Professional Standards for Nigerian Teachers (PSNT). The validated and reliable checklist was used to collect the needed data. The results showed that male graduate/NCE, and experience physics teachers exhibit high level of compliance with the professional knowledge and skills contained in the PSNT. Based on the findings of the study, several implications for the education of science (physics) teachers were advanced. Recommendations were made to include that the TRCN in conjunction with teacher education supervising agencies should explore ways of raising the quality and relevance of teacher education curricula in line with the professional standard demands.*

KEY WORDS: Professional Knowledge, Professional Skills, Education, Science Teachers, Physics Teachers,

INTRODUCTION

Education basically consists of two components: inputs and outputs. The inputs has to do with human and material resources while the outputs are the goals and outcomes of the educational process, of which academic performance is most prominent. Therefore, in considering education inputs, the teacher's role cannot be over-emphasized. According to Buddin and Zamarro (2010), teacher quality is a key element of student academic success. This assertion was corroborated by the National Centre for Education Standard when in 2013, it measured and found out that teacher factor stands as a major pivot in students' general achievement. A teacher is an influential key player in any pedagogical scheme. The teacher is seen as key to the achievement of the 2030

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Education Agenda following the adoption of Sustainable Development Goal (SDG)4 on education and the dedicated target (SDG 4.c). Underscoring the prime role of teachers in transmitting education, the 2018 World Teachers Day (WTD) had as its theme "The right to education means the right to a qualified teacher". This comes several decades after the 1966 ILO/UNESCO recommendation which regard teaching as a form of public service which require of teachers, expert knowledge and specialized skills, acquired and maintained through rigorous and continuing study.

Agyeman (1993) in Kafui (2005) reported that a teacher without good academic and professional teaching qualification would undoubtedly have a negative influence in the teaching/learning of his/her student. Thus, the bedrock of any educational system lies on a core of devoted, knowledgeable, competent and qualified teachers. Put differently, qualification, experience and such related variables are known to increase teachers' effectiveness and attendant learning outcomes (Usman, 2003). The teacher therefore is the most important factor required by the society for effective realization of its political, economic, technological, moral and social development objectives and aspirations (Nwaubani, 1998).

It can further be adduced that the emergence of future generation of scientist cannot be possible without the science teacher. And this can only be through science teaching that has been clearly acknowledged as the most vital and strategic profession for national development. Without professional (science) teachers, the cumulative effect would be no development and national retrogression rather than development and progression (Ukeje, 1996).

Physics as a core science subject is taught at the senior secondary level of the educational system in Nigeria and is aimed at training the students to acquire proper understanding of the basic principles of physics and to be able to apply the knowledge acquired both in industries and homes. For science and or physics teaching to fulfill its goals/aims, teachers' competences play very significant role. Teacher competences imply a wider systemic view of teacher professionalism, on multiple levels – the individual, the school, the local community and professional networks. According to Hagger and McIntyre (2006), they are focused on the role of the teacher in the classroom directly linked with the 'craft' of teaching - with professional knowledge and skills mobilized for action.

Teacher competences which combines cognitive and meta-cognitive skills dynamically implies that there are four fundamental aspect to it, viz: learning to think, know, feel and act as teachers (Gonzakz and Wagenaar, 2005; Feiman-Nemser, 2008). Of these four, only learning to think and know as teachers have a bearing on this study and implies linking objectives and means in the teaching/learning processes, analytical and conceptual thinking and development of metacognitive awareness and the need for deep subject and pedagogical content knowledge, knowledge of new techniques applied to subject teaching in this digital age; knowledge of school curricula, classroom management, methodologies, educational theories and assessment in a wider awareness of impact of educational aims (Anderson, 2004; Darling-Hammond and Gransford, 2005; Mishra and Krechler, 2006).

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Moreso, conceptualizations of teacher competences are linked with visions of professionalism, among others. And teacher professionalism include extensive pedagogical content knowledge, better problem solving strategies, better adaptation for diverse learners, better decision making, better perception of classroom events, greater sensitivity to context, and greater respect for students (Guerriero, 2015).

A professional standard describes what teachers believe, know, understand and are able to do as specialist practitioners in their fields (Ingrarson, 1998). It focuses on what teachers are expected to know and be able to do. Without it professionalism in teaching which offers theoretical and practical knowledge, essential codes of conducts, continuous in-service development and rendering of essential and qualitative services to society (Givar, 2003) will be difficult to ascertain. Even so, those trained for teaching, such as physics teachers, who remain on the job and who abide by all the rules and regulations put in place to uplift the vocation would be difficult to assess.

The National Teacher Education Policy (2009) articulates the vision, goal and objectives of Teacher Education in Nigeria as that of producing quality, highly skilled, knowledgeable and creative teachers based on explicit performance standards. Even the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Labour Organization (ILO) recommend that professional standards relating to teacher performance should be defined and maintained. In Nigeria, the professional standards has been put in place since 2010 by the Teachers Registration Council of Nigeria (TRCN) not only as descriptive tools for reflection and guidance for professional action but as one that can help identify development opportunities and needs at individual, school level and beyond (Pyke and Lynch, 2005; Conway et al, 2009). The professional standards for Nigerian Teachers is to serve as a benchmark for the performance of teachers in terms of knowledge, skills, attitude, values and conduct.

This study will however restricts itself to professional knowledge and professional skills components of the Professional Standards for Nigerian Teachers (PSNT). The study seeks to ascertain the level of compliance of physics teachers in senior secondary schools in Akwa Ibom State to two out of its four major themes based on their gender, qualification and experience.
And because of the variables of interest so delineated with respect to the physics teachers, there is the need to explore research literature in the areas of gender, qualification and experience of science (physics) teachers.

Gender issues remain very paramount in understanding achievement-related behaviour. Male and female teachers will naturally exhibits feminine and masculine traits such as tolerance, energy, assertions, body communication, etc. Gender biased behaviours of teachers has been discovered as insidious problem. Odunaike, Ijaduola and Amola (2013) carried out an empirical analysis of teachers' gender and secondary school students' academic performance and found out that female teachers put extra effort in ensuring high standard of performance by students than their male counterparts who perceive teaching as a profession for the weaker sex (female). Female school teachers have also been found to exhibit more positive attitude towards the profession as compared to the male secondary school teachers (Hussain et al, 2011).

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Research has equally been conducted that demonstrate the positive impact a male teacher can have on students (Mills, Hasse and Charlton, 2008; McGrath and Sinclair, 2013). However, Dundar (2010) in a survey of 176 male and female teaching candidates, found that male teacher candidates choose teaching as a fallback career.

Teachers' qualification means all the skills a teacher require to teach effectively. Such skills include formal education, subject matter knowledge, pedagogy studies, duration of training, certificate/licensing and professional development (Zuzovsky, 2009). While scholars such as Neild and Byrnes (2009) and Goldhaber and Brewer (2000) believed that higher degrees showed positive correlation with students' academic achievement, others such as Darling Hammond (2000) and Ehrenberg (2008) believed that higher degrees had an adverse correlation with students' achievement. Shanim and Rashid (2013) found that pedagogical studies enable teachers to harmonize the minds and emotions of their students in class, thereby resulting to higher academic achievement. In most schools in Nigeria, teachers who are academically qualified and those that are professionally qualified are engaged to carry out instructional process. Furugia (2017) perceive a professional teacher as one who possesses professionally based knowledge in the theory and practice of education and can find job satisfaction in the belief that he or she is making an important contribution to the social, cultural and economic development of his or her country. Such a teacher should be able to assist students to reach their full intellectual and social potentials. But Okebukola in Ngada (2018), while remarking on teachers' quality observed that over 80% of respondents in a survey research were of the views that teachers are carriers of weaknesses. These weaknesses include among others; inadequate exposure to teaching practice (experience), poor classroom management and control, shallow subject matter and lack of professionalism.

A teachers' year of experience is one of the teacher qualification indicators that is believed to be a significant determinant of students' academic performance. Teacher experience includes all activities undertaken by the teacher in the pre and post teacher training exercise. It also include participation in professional development activities geared towards equipping the teacher for better service delivery. According to Ademulegun (2001), students taught by more qualified and experienced teachers in terms of knowledge of subject matter performed better than those taught by less qualified but experienced teachers. There is therefore a positive relationship between teachers' effectiveness and their years of experience and efficient teachers positively influence students' academic achievement (Agharuwhe, 2013). Seweje and Jegede (2005) noted that the ability of a teacher to teach is not derived from one's academic background but it is based upon outstanding pedagogical skill and experience acquired.

A critical appraisal of the literature review showed that previous researchers were preoccupied with the effect of the variables of interest on students learning achievement. There is also lack of indigenous studies on assessing teachers' professional standing. This study is intended to bridge these gaps by ascertaining the level of compliance of public secondary school physics teachers in Akwa Ibom State with the Professional Standards for Nigerian Teacher (PSNT), considering the themes of professional knowledge and professional skills.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Statement of Problem

A major requirement for the preparation of quality teachers is the capacity to systematically assess one's own knowledge base and the professional practices on the basis of a wide range of criteria coming from practice, theory and research (Hagger and McIntyre, 2006). In Nigeria, the TRCN established by Act No. 31 of 1993 as an approved government agency for the regulation and control of the teaching profession in all aspects and ramifications, at all levels of the Education system in public and private sectors have created benchmarks on four vital aspects of professional life namely: professional knowledge, skills, attitude and values. And with the recognition that the professional competence of a teacher which contributes to mastery of teaching and learning are knowledge, skills, attitude and motivational variables (Anderson, 2004; European Union, 2009), this study beams its searchlight on the professional knowledge and skills of physics teachers as important factors in achieving high quality educational outcomes. The study intends to serve accountability and quality mechanisms purposes for physics teachers, considering their gender, qualification and experience. The question is: What is the level of compliance of physics teachers in public secondary schools in Akwa Ibom State with the professional knowledge and skills requirements in the professional standards for Nigerian Teachers, considering their gender, qualification and experience? This is with a view to examining the implications of the study findings for the education of science teachers in the state.

Purpose of the Study

The purpose of this study was to ascertain the level of compliance of physics teachers to the requirements in the professional standards for Nigerian teachers.

Specifically, this study sought to investigate the following:

1. Whether gender has any influence on physics teachers' level of compliance to the professional knowledge and skills requirements in the PSNT.
2. Whether qualification has any influence on physics teachers' level of compliance to the professional knowledge and skills requirements in the PSNT.
3. Whether experience has any influence on physics teachers' level of compliance to the professional knowledge and skills requirements in the PSNT.

Research Questions

The following research questions guided the study:

1. What is the level of compliance of male and female physics teachers to the professional knowledge and skills requirements in the PSNT?
2. What is the level of compliance of graduate and NCE teachers to the professional knowledge and skills requirements in the PSNT?
3. What is the level of compliance of experienced and inexperienced physics teachers to the professional knowledge and skills requirements in the PSNT?

METHODOLOGY

Research Design: The research design adopted for the study was descriptive survey design.

Area of Study: The area of the study was Akwa Ibom State (statewide survey), covering the three (3) senatorial districts (Akwa Ibom North East or Uyo Senatorial District with nine (9) local

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

government areas; Akwa Ibom South or Eket Senatorial District with eleven (11) local government areas and Akwa Ibom North West or Ikot Ekpene Senatorial District with ten (10) local government areas).

Population of Study: This consisted of all physics teachers in all public secondary schools in the three senatorial districts of Akwa Ibom State of Nigeria. The estimate stood at 354 physics teachers.

Sample and Sampling Technique: The study sample was made up of 120 physics teachers chosen through purposive sampling technique utilizing the following criteria: proportionate selection of respondents (professional physics teachers) from each senatorial districts; categorization of selected respondents as male and female, graduate and NCE, experienced and inexperienced physics teachers. The criteria resulted in 86 and 34, 66 and 54, 70 and 50 physics teachers respectively in all the three senatorial district of the State. (For further breakdown see the tables of results). The criteria took cognizance of the fact that the categorization of teachers in Nigeria appreciates experience founded on possible academic qualification. Also in the secondary school level in Akwa Ibom State, category C (graduate teachers) or holders of Bachelor's Degree in Education or Bachelor's Degree in other field plus teaching qualification, e.g. PGDE, NCE and category D (NCE Teachers) or holders of Nigeria Certificate in Education which is the minimum teaching qualification abound, as males and females.

Instrument for the Study: The instrument for the study was the Physics Teachers Knowledge and Skills Checklist (PTKSC). This utilized the 25 standards spelt out in the two subthemes of the TRCN professional standards for Nigerian teachers in respect of professional knowledge and professional skills. Professional knowledge with seven (7) subthemes namely: subject content, pedagogy, national curriculum requirements, literacy and numeracy, information and communication technology, students' socio-economic background and students' physio-psychologically background together with professional skills in ten (10) subthemes that covers planning, resourcefulness, teaching and communication, evaluation of learner's performance, reporting, record keeping, programme monitoring and evaluation; health, safety and human rights, learning environment and team work collaboration, were combined in the checklist to have a total of 25 standards. The four-point level of compliance were: poor (1 mark), fair (2 marks), good (2 marks) and excellent (4 marks). This instrument is therefore an abridged adoption of the Professional Standards for Nigerian Teachers Checklist (PSNTC).

Validation of the Instrument: The PTKSC was found to satisfy face or rational validity through the consensus of opinions of a team of three physics educators. Their logical appraisal reaffirmed the appropriateness of the two themes adopted from the TRCN document as well as the objectivity and comprehensiveness of the measurable standards under them. The range of ability of respondents as serving physics teachers in the school system also boosted the validity of the instrument. And as a national performance measuring instrument for teachers, it was deemed valid.

Reliability of the Instrument: The reliability of the PTKSC was estimated using Cronbach Alpha and a coefficient of 0.85 was obtained. The reliability exercise considered the variability of the tested groups in the study sample on their response ability in improving the instrument.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Scoring of Instrument: Since level of compliance with the professional knowledge and skills standards was required from each respondent, the minimum and maximum scores of 25 and 100 were added together and divided by two to have a cut-off point score of 62.5, approximately 63, which is the pass mark. Therefore, scores above and below this cut-off score was deemed high and low levels of compliance respectively. This was arrived at by finding the class mark of the scores interval of respondents in the three categories of interest.

Administration of Instrument: The checklist for the study was used by the researchers to assess the 120 physics teachers in the three senatorial districts of the state that satisfied the sampling technique criteria adopted. All the 120 PTKSC were scored by interaction with the respondents and their principals/vice principals (Academic).

Method of Data Analysis: Data collected from the administered checklists were analyzed descriptively. The scores obtained by the respondents were grouped into interval based on the categorization used, and mean marks were then determined, to allow for remark to be made on the level of compliance.

RESULTS/DISCUSSION

The data obtained with the checklist and treated as earlier specified is presented on Table 1 to 3 below.

Research Question One

What is the level of compliance of male and female physics teachers to the professional knowledge and skills requirements in the PSNT?

Table 1: Summary of male and female physics teachers' level of compliance with professional knowledge and skills requirements in the PSNT (N = 120)

		Level of Compliance			
		N	Scores Interval	Class Mark	Remark
Gender	Male	86	64 - 96	80	High
	Female	34	22 - 53	38	Low

NB: Cut-off point score is 62.5 or 63 (pass mark)

A look at Table 1 above showed that male physics teachers compliance level scores were within the interval 64 – 96 while that of female physics teachers were within the interval 22 – 53. This resulted in the class marks of 80 and 38 for the male and female teachers respectively. And

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

comparing their class mark to the cut-off point score, it is clear that male physics teachers have high level of compliance with the professional knowledge and skills standards in the PSNT while their female counterparts have low compliance level. This implies that compared to their female counterparts, male physics teachers know the content of the subjects they teach, how to teach subject content to their students and related assessment and monitoring strategies, the national curriculum requirements, literacy and numeracy, the application of modern computer systems and communication technology; the diverse socio-cultural, ethnic and religious background of students and their effects on learning, the stages of human development and the physical, social and intellectual implications of each stage; how to plan learning programmes, teaching and learning goals, how to select and organize content in lesson notes preparation, how to develop and use instructional resources, how to effectively communicate and interact with students in the classroom, how to group students, how to use the several teaching methods/strategies, how to administer assessment that are reliable and valid; how to provide feedback to students, parents, guardians and other stakeholders, how to maintain records of students performance in acceptable formats, storage and retrieval systems; how to adhere to relevant national and international health, safety and human rights law, how to create and sustain exciting learning environment and how to work as team members.

This could be attributed to gender biased behaviours and energy deployed in their teaching duties. This is in consonance with the findings by Haase and Carlton (2008) and McGrath and Sinclair (2013). The male teachers may not actually take teaching as a fallback career. This finding is also in disagreement with the study by Hussain et al (2011) that reported that female teachers exhibit more positive attitude towards the teaching profession than their male counterparts.

Research Question Two

What is the level of compliance of graduate and NCE teachers to the professional knowledge and skills requirements in the PSNT?

Table 2: Summary of graduate and NCE physics teachers' level of compliance with professional knowledge and skills requirements in the PSNT (N = 120)

			Level of Compliance		
		N	Scores Interval	Class Mark	Remark
Qualification	Graduate	66	68 - 75	72	High
	NCE	54	60 – 72	66	High

NB: Cut-off point score is 62.5 or 63 (pass mark)

In Table 2 above, it can be clearly seen that for both graduate and NCE physics teachers in public secondary schools in Akwa Ibom State, the class marks ascertaining their level of compliance with

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

the professional knowledge and skills requirements in the PSNT are 72 and 66 respectively. Using the cut-off point score as reference, it is evident that both categories of teachers by their qualification have very close high levels of compliance in the two themes assessed in the study. This implies that graduate and NCE teachers in the employ of Akwa Ibom State government exhibit high professional standing in the knowledge of subject content, pedagogy, national curriculum requirements, literacy and numeracy, information and communication technology, students' socio-economic background and students' physio-psychological background, as well as professional skills in planning, resourcefulness, teaching and communication, evaluation of learners' performance, reporting, record keeping, programme monitoring and evaluation; health, safety and human rights, management of learning environment, team working and collaboration. These result could be explained on the basis of their professional status, where their skills in subject matter knowledge, pedagogy studies and commitment to their duties is brought to bear for the good of the students, the school system and the state. This results is in line with the submission by Furugia (2007).

Research Question Three

What is the level of compliance of experienced and inexperienced physics teachers to the professional knowledge and skills requirements in the PSNT?

Table 3: Summary of experienced and inexperienced physics teachers' level of compliance with professional knowledge and skills requirements in the PSNT (N=120)

			Level of Compliance		
		N	Scores Interval	Class Mark	Remark
Experience	6 years and above	70	72 - 108	90	High
	Below 6 years	50	58 - 62	60	Low

NB: Cut-off point score is 62.5 or 63 (pass mark)

Table 3 revealed an interval of scores between 72 and 108 for the experienced teachers (that is having served 6 years and above) and an interval of scores between 58 and 62 for inexperienced teachers (that is, having taught less than 6 years). The class marks for the experienced and inexperienced categories are 90 and 60 respectively, indicating a high and low levels of compliance by the physics teachers as grouped. However, it is clear that teachers who have been in the teaching service for 6 years and above (that is, experienced teachers), have a class mark far above the inexperienced physics teachers. This implies that in terms of the sub-themes, standards and expected performance under professional knowledge and skills, the experienced physics teachers have shown a much higher level of compliance than their inexperienced colleagues. The result indicates that the experienced physics teachers utilized their training abilities coupled with possible

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

professional development activities to ensure efficient service delivery. This findings agrees with the views of Ademulegun (2001) and Agharuwhe (2013).

However, it must be observed that the evaluated units in the sub-themes of pedagogy, national curriculum requirements, information and communication technology and students' socio-economic background/cultural diversity recorded fair and poor ratings in the level of compliance. This is a pointer to the areas that require attention to ensure good or excellent (high) level in physics teachers professional standing in knowledge and skills provisions in the PSNT.

Summary of Findings: The following findings resulted from this study.

1. Male physics teacher in public secondary schools in Akwa Ibom State exhibit a high level of compliance with the professional knowledge and skills requirements in the PSNT than their female counterparts.
2. Both graduate an NCE physics teachers in the public secondary schools in Akwa Ibom State show relatively high levels of compliance with the professional knowledge and skills provisions in the PSNT.
3. Experienced physics teachers show high level of compliance with the professional knowledge and skills requirements in the PSNT compared to the inexperienced physics teachers.

IMPLICATIONS OF FINDINGS

The National Policy on Education (NPE) stipulates that the minimum qualification for entry into the teaching profession shall be the Nigeria Certificate in Education. Also, the goals of Education in Nigeria (Section 5, paragraphs 77a and d are to produce highly motivated, conscientious and efficient classroom teachers for all levels in our educational system and to provide teachers with the intellectual and professional background adequate for his assignment and to make them adaptable to changing situations. Teacher education programmes is to be structured to equip teachers for the effective performance of their duties. Furthermore, the policy states that teacher education shall continue to take cognizance of changes in methodology and in the curriculum, and that teachers shall be regularly exposed to innovations in the profession. In the light of the above and with the findings of this study in view, there arose implications for the education of science teachers.

Since education of good teachers rest on three components namely: general education, specialized subject-field education and professional education, there is need for relative emphasis on each component through the devotion of much time for specialized subject field and professional education. This will expose male/female teachers, and experienced/inexperienced teachers to expected performance standards, that will ensure high level of compliance with the provisions of the professional knowledge and skills themes in the PSNT. Clinical experience which emphasizes practice in actual school settings should be given adequate attention during the education of science teachers and should not aim at producing teachers versed in pedagogy at the expense of academic content.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Schools cannot succeed without trained and qualified teachers. There is need to sustain the focus on teachers competency during the education of science (physics) teachers, in respect to their pedagogical practices and strategies as well as mastery of the curriculum and subject content. The science (physics) teacher should be encouraged to pursue further studies in both physics and teaching pedagogy, as this will increase their experience as opposed to scenarios where many schools only lay emphasis on possession of a graduate degree. Prospective physics teachers should be made to offer physics courses that are relevant to the senior secondary school curriculum. Education of teachers should address reflective teaching where science (physics) teachers will observe and think about the results of their teaching and adjust their methods accordingly.

Teachers' professional qualification is tied to their competence in instruction and management of students and materials in the classroom. The Nigerian educational system should intensify professional training of all science teachers in educational institutions nationwide. This will enhance science (physics) teachers commitment to the teaching profession. Regarding the observations in some of the evaluated units such as information and communication technology and students socio-economic background, technology training for science teachers through the use of computer or technology laboratories should be undertaken, where a wide variety of activities and objectives featuring computer use, familiarization with hardware and software and interest/capacity in technology for lesson design or delivery are strengthened. The diverse cultural and ethnic settings of public secondary schools in Akwa Ibom State should prompt additional components to help science (physics) students operate successfully in these diverse setting.

CONCLUSION

It is concluded that for the different categorization of physics teachers in Akwa Ibom State viz: male/female, graduate/NCE and experienced/ inexperienced high level compliance with the professional knowledge and skills standards by male experienced and graduate/NCE teachers were ascertained. However, few evaluative units of the subthemes that requires urgent attention were addressed alongside the findings of the study, through well-articulated implications for the education of science (physics) teachers.

RECOMMENDATIONS

Based on the finding and implications, the following recommendations were made:

1. Effort should be made by teacher training institutions and government to educate physics teachers for high level of compliance with professional standards, especially professional knowledge and skills that determines students' learning and achievement.
2. Female and inexperienced physics teachers should be given special attention to further acquaint themselves with the expected performance in the professional knowledge and skills standards.
3. The Teacher Regulation Council of Nigeria (TRCN) in conjunction with Teacher Education Supervisory Agencies such as NUC and NCCE should explore ways of raising the quality and relevance of teacher education curriculum in line with professional standards demands.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

4. Relevant agencies should supervise and inspect schools regularly to ensure maintenance of professional standards by physics teachers.

REFERENCES

Ademulegun, D. (2001). *Monitoring learning achievement of junior secondary school students in Lagos State: A prototype of state assessment*. Unpublished Ph.D Thesis, University of Ibadan.

Agharuwhe, A. A. (2013). Effect of teachers' effectiveness on students' academic performance in public secondary schools. *Journal of Educational and Social Research*, 3, 105-111.

Anderson, L. W. (2004). *Increasing teacher effectiveness* (2nd ed.) Paris: UNESCO, ILEP.

Buddin, R. J. & Zamarro, G. (2009). Teacher qualifications and student achievement in urban elementary school. *Journal of Urban Economics*, 66(2), 103-115.

Ciwar, A. M. (2003). *Teacher registration as a vehicle for professionalization of teaching: Prospects and challenges* (NAE Seminar Series No.4). Lagos: The Nigerian Academy of Education.

Conway, P. F., Murphy, R., Ruth, A. R. & Hall, K. (2009). Learning to teach and its implication for the continuation of teacher education: A nine-country cross national study. *Report commissioned by the Teaching Council, University College Work and Teaching Council of Ireland*.

Darling-Hammond, L. (2000). Teacher quality and students' achievement: A review of state policy evidence. *Education Policy Archives*, 8(1), 150-157.

Darling-Hammond, L. & Bransford, J. (Eds) (2005). Preparing teachers for a changing world. *Report of the Committee on Teacher Education of International National Academy of Education*. San Francisco.

Dundar, S. (2010). Reasons for choosing the teaching profession and beliefs about teaching: A study with elementary teacher candidates. *College Student Journal*, 48(3), 445-460.

Ehrenberg, R. G. (2016). Do teachers' race, gender and ethnicity matter? Evidence from the National Educational Study of 2005. *Industrial and Labour Relations Review*, 48, 547-561.

European Union (2009). Council conclusions of 28 November 2009 on the professional development of teacher and school leaders. *Official Journal* 2009 (c 302/04-12-12-2009).

Feiman-Nemser, S. (2008). Teacher learning: How do teachers learn to teach? In Cockran-Smith, M., Feiman-Nemser, S., McIntyre, D. (Eds.) *Handbook of Research on Teacher Education enduring quality in changing contexts*. NY-Abingdon: Routledge/Taylor and Francis.

Furugia, C. (2017). *The challenges of scale: Educational development in small states of the commonwealth*. London: Paul Mau.

Goldhaber, D. D. & Brewer, D. J. (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis*, 22(2), 129-145.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Gonzakz, J. R. & Wagenaar, R. (Eds) (2005). Tuning educational structures in Europe II. University's contribution to the Bologna process. University of Denstr and University of Groningen. http://tuning.unideustu-org/tuningedu/. Retrieved on June 10, 2018.

Guerriero, S. (2015). *Teacher pedagogical knowledge and the teaching profession*. Paris: OECD Publishing.

Hagger, H. & McIntyre, D. (2006). *Learning teaching from teachers: Realizing the potential of school-based teacher education*. MaidenHeda; Open University Press.

Hussain, et al. (2011). Nutrient evaluation and elemental analysis of four selected medicinal plants of Khyber pakhtoon khwa, Pakistan. *Pakistan Journal of Botany*, 43(1), 427-434.

Inguarson, L. & Wright, J. (1998). Professional development as the pursuit of professional standards: The standards-based professional development system. *Teaching and Teacher Education*, 14(1), 99-115.

Kafui, E. (2005). Causes of low academic performance of primary pupils in the Shama sub-metro of Shama Ahanta East metropolitan assembly (SAEMA) in Ghana. *Regional Conference on Education in West Africa*, Dakar, Senegal.

McGrath, K., & Sinclair, M. (2013). More male primary school teachers? Social benefits for boys and girls. *Gender Education*, 25(5), 531-547.

Mills, M., Haase, M. & Charlton, E. (2008). Determining the "right" kind of male teacher: The disciplining of John. *Pedagogy, Culture and Society*, 16(1), 71-84.

Mishra, P. & Koehler, M.J. (2006). Technological pedagogical content: A new framework for teacher knowledge. *Teacher College Record*, 108(6), 1017-1054.

Nield, R. C. & Byrnes, V. (2009). The effect of teacher certification on middle grades achievement in an urban district. *Educational Policy*, 23(5), 732-760.

Ngada, A. J. (2008). Impact of NCE programme on preparation and performance of NCE graduate teachers in Borno State secondary schools. *Research in Curriculum*, 5(1), 190-195.

Nwaubani, O. O. (1998). Towards a new direction for teacher education in Nigeria in year 2010: Issues, problems and prospects. *Journal of Education for National Development*, 1(1), 23-31.

Odunaike, K. V., Ijaduola, K. D. & Amoda, M. B. (2013). Empirical analysis of teachers' gender and secondary school students academic performance. *Asian Economic and Financial Review*, 3(3), 355-362.

Pyke, C. L. & Lynch, S. (2005). Mathematics and science teachers' preparation for National board of professional teaching standards certification. *School Science and Mathematics*, 105, 25-35.

Seweje, R. O. & Jegede, S. A. (2005). *Science education and science teaching methods*. Lagos: Atlantic Association.

Shanim, M. & Rashid, R. (2013). Students' academic performance as correlates of the experience of teachers in higher secondary schools of Jammu and Kashmir State. *Scientific Research Publishing*.

Ukeje, B. O. (1996). Teacher education for national development. In Lossa, P. N. (Ed), *Teacher Education: An Imperative for National Development*. Kaduna: NCCE.

Zuzovsky, R. (2010). Teachers' qualification and their impact on student achievement. Findings from Timss 2003 data for Israel. Retrieved June 16, 2018 from http://www.ierinstitute.org/IERS.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)

Teachers' Registration Council of Nigeria (TRCN) (2010). *Professional standards for Nigerian teachers*. Abuja: Author.

Print ISSN: 2054-6351 (print), Online ISSN: 2054-636X (online)