



## MICRO-TEACHING AND TEACHING PRACTICE: A PREDICTOR OF PHYSICS TEACHER TRAINEE'S PERFORMANCE

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### Article Info

#### Article history:

Received: November 23, 2021

Accepted: March 13, 2022

Published: March 31, 2022

#### Keywords:

Micro-teaching  
 Physics  
 Teaching practice  
 Teacher trainee

### ABSTRACT

Microteaching and teaching practice are important and compulsory twin course for any teacher trainee student in Nigeria before becoming a professional teacher. The former pave the way for the later and it is intended to prepare teacher trainee for the real teaching practice exercise. This study investigate whether microteaching successfully predict the performance of physics teacher trainees in teaching practice. This investigation is a quantitative research which adopt the ex post facto research design. It involved a cohort of 638 final year Bachelor of Science Education (Physics) students spanning four academic sessions (2015/2016-2018/2019). The only research question and hypothesis raised were answered and tested using mean/standard deviation and t-test statistics respectively. The result reveal a moderate positive relationship between the performance of physics teacher trainees in microteaching and teaching practice. This study concludes that micro-teaching viably predicted student's performance in teaching practice.

## PENGAJARAN MIKRO DAN PRAKTIK MENGAJAR: SEBUAH PREDIKTOR KINERJA CALON GURU FISIKA

### ABSTRAK

#### Kata Kunci:

Pengajaran mikro  
 Fisika  
 Praktek mengajar  
 Guru trainee

Pengajaran mikro dan praktik pengajaran adalah kursus kembar yang penting dan wajib bagi setiap siswa peserta pelatihan guru di Nigeria sebelum menjadi guru profesional. Yang pertama membuka jalan bagi yang berikutnya dan ini dimaksudkan untuk mempersiapkan peserta pelatihan guru untuk latihan praktik mengajar yang sebenarnya. Penelitian ini menyelidiki apakah microteaching berhasil memprediksi kinerja peserta pelatihan guru fisika dalam praktik mengajar. Penelitian ini merupakan penelitian kuantitatif yang mengadopsi desain penelitian ex post facto. Ini melibatkan kohort 638 mahasiswa tahun terakhir Pendidikan Ilmu Pengetahuan (Fisika) yang mencakup empat sesi akademik (2015/2016- 2018/2019). Satu-satunya pertanyaan penelitian dan hipotesis yang diajukan dijawab dan diuji masing-masing menggunakan mean/standar deviasi dan statistik uji-t. Hasil penelitian menunjukkan hubungan positif sedang antara kinerja peserta didik guru fisika dalam microteaching dan praktik mengajar. Studi ini menyimpulkan bahwa micro-teaching secara layak memprediksi kinerja siswa dalam praktik mengajar.

## 1. INTRODUCTION

Education have been popularly acclaimed to be an instrument for nation development. This claim was asserted by Omosewo who opined that education plays an important role in keeping a nation to terms with the realization of its objectives [1]. Prominent among those who contribute her quota to nation development is the teaching profession, which plays her professional role in developing and producing professionally trained teachers for the nation. Davids opined that a nation's educational system and in particular its teacher education programs becomes crucial in determining the quality of education impacted to learners [2]. This assertion does not exclude the developed nations not to talk of developing nations like Nigeria, because teachers play a crucial role towards a nation's match towards success. The sensitive role played by professionally trained teachers cannot be overemphasized.

Teachers play a prominent role in transferring the cultural heritage of a nation from one generation to another. This will go a long way in preserving the ways of life and culture of a particular society. Therefore, Oyekan opined that the teacher is the crucial engine and brainpower that sustains the teaching-learning process of any functional educational system [3]. Since education is geared towards the realization of this objectives, the role and training of professional teachers should not be taken for levity. Teacher training institutions such as the Colleges of Education and Faculties of Education are thus saddled with the production of well qualified teachers who have been professional trained, mentored, and experienced in the business of teaching and learning.

Teacher education thus helps in the production of qualified and professionally trained teachers that will be saddled with the act of teaching in the different levels of education. Dashe opined that teacher education involves initiating, preparing and giving would-be professionally teachers the needed skills, experiences and abilities that will make them perform their responsibilities well as teachers [4]. All these can only be achieved through the maintenance of best practices in the business of teacher education. According to Joshua, he defined teacher education as the process of training, which is concerned with the business of acquiring professional skills and competencies [5]. The training of professional teachers usually is for a reasonable long time which conforms to one of the characteristics of a profession. Ogunmakin defined teacher education as planned and designed change undertaken to tackle deficiencies and needs with the conviction that substantial progress can be made in the development of teaching process through the application of Information Communication Technology (ICT) in teaching practice practicum [6].

A good teacher education should seek to make teacher trainee grow and develop into people with the necessary skills and professional competencies in the act of impacting knowledge. This made the Federal Republic of Nigeria to reiterate that teacher education should be accorded special attention because no nation can rise above the quality of its teachers [7]. Mohammed and Shuaib defined teacher education as a sound education given to teachers for effective teaching and proper management of resources [8]. This implies that teacher education refers to all the activities carried out in order to equip would-be teachers with all the prerequisite skills and knowledge that will in turn make them professional teachers, so as to ensure good and impactful teaching-learning process.

Teacher education in Colleges of Education and Faculties of Education constitute two components as stipulated in the minimum standard for Colleges of Education and Universities. The first component is the theoretical dimension while the second is the practical component. The theoretical component involves the learning of the different courses that have being carefully planned and highlighted for all teacher trainee to take.

This courses have been listed in the curriculum for training teachers. The other component in the curriculum for training teachers is the practical component. This component is divided into two phases namely microteaching and teaching practice.

Microteaching is one of the compulsory course physics teacher trainee must undertake during his or her teacher education either in the Institute of Education, Colleges of Education or Faculties of Education in the University. It is a major component of teacher education that tends to introduce teacher trainee to the practical aspect of teaching. Microteaching is a process by which teacher trainee teaches 5 to 10 students within a short time, with emphasis on the development of a specific teaching skill after which assessment of performance is carried out based on some clear-cut criteria and with the provision to re-teach if need be. Micro-teaching can be said to be an aspect of teacher education curriculum that encourages on-the-spot assessment of skills that are relevant and required for the complete and efficient training of would-be teachers.

Akinbobola and Bada identified five categories of on-the-spot assessment of science process skills to include communicative, manipulation, creative, organization and acquisitive skills [9]. Teaching has been argued to be a process of science because it follows clear and objective procedures such as principles, theories and laws, actions and events in teaching always lead to predictable outcomes. This clearly proves that teaching complies with the systematic order of carrying out scientific investigations and assignment. National Teacher Institute defined microteaching as a technique of training teacher trainees teaching skills such that the teaching is scaled down in terms of class size, time and skill [10]. Microteaching is used to emphasize the development of an already identified skill within a very short time while also being mindful of the class size.

This made Udo and Ushie to define microteaching as a scaled down sample of actual teaching. Microteaching is usually practiced with a small population of students with the intention to learn a single skill or concept within a very short time [11]. Some researchers opined that microteaching reduces the complexity associated with real teaching and it gives an immediate feedback that can be achieved after each practice session [12-13]. While Ambile defined microteaching as a scaled down teaching scenario created to help develop new teaching skills and also assist in updating old ones [14].

Teaching practice, the practical component of the teacher training curriculum is a practical course or exercise that teacher trainees will have to pass before being certified as professional teachers. It is a practical exercise that takes place in the penultimate class when teacher trainee would be asked to go for practical teaching in a real-life school system. Teacher trainee final year students undertaking the Bachelor of Education program undergoes a twelve weeks of practical teaching at the primary or secondary school levels of education. This is to allow teacher trainees to put what has been learnt in theory to practice. This agrees with Ntasaluba and Chireshe who opined that the underlying aim of teaching practice is to introduce students to and prepare them for the teaching profession [15].

Oyekan defined teaching practice as a pre-service professional preparation for interested persons aspiring to become teachers with a credible vision for sustainable human development [16]. Teaching practice is also defined as an integral empowerment of teacher training because it is one of the major component of the teacher education curriculum [17]. Teaching practice is a practical teaching activity by which teacher trainee are given the opportunity in actual school situations to demonstrate and improve training in pedagogical skills over a period of time. Teaching practice, among other objectives provide an avenue for teacher trainees and their teachers to translate theory into practice. It has inculcated in the teacher trainee the basic teaching skills and ethics which facilitate teaching learning

process. Teaching practice also provide teacher trainees the opportunity to imbibe practical classroom life experiences.

In this article, we argue that microteaching is evaluated in the light of the scores teacher trainees achieved on the course physics teaching methods which is a prerequisite course before teacher trainee will be asked to proceed to teaching practice. Teacher trainees proceed for teaching practice and are assessed by professional trained teachers and lecturers who are subject specialist in the Physics/Physics Education. The objective of this article is to investigate whether physics teacher trainee's performance in microteaching predict their performance in teaching practice The only research question we intend to answer is: 'Is there relationship between the performance of physics teacher trainees in microteaching and teaching practice?' We are also interested in testing the only research hypothesis: there is no significant difference between the performance of physics teacher trainee in microteaching and teaching practice. This is considered important because despite the consensus in literature of the importance of microteaching to the professionally training of would-be teachers [18-22], there is the need to find out if microteaching successfully predicts teacher trainee's performance during teaching practice exercise.

Microteaching and teaching practice have been discussed both international and nationally and a consensus have been reached that both constitute an important aspect of teacher training [18-22]. Also, several concepts has been used to represent students undergoing professional teacher training in tertiary institutions. Literature records that concepts such as teacher candidate [21], pre-service teachers [23-25], education students [26], [2], student teachers [27-31], and teacher trainees [22] have been used to refer to higher education students enrolled in the different institute of education, colleges of education and the different faculties of education.

Microteaching is defined as the implementation of the knowledge and skills related to teaching in a controlled class and a limited time, identification and overcoming the deficiencies through the use of feedback [22]. This implies that microteaching allows teacher trainees to develop special skills and to also get feedbacks so that they can improve on their skills before going for the actual teaching in schools. This skills are important to ensure the complete training and development of teacher trainees because it makes them to function. Demirel opined that teachers' skills is a concern to every nation and it can be divided into personal and professional skills [19]. He also posited that professional skills such as planning, identifying, and using right methods and techniques, effective communication, keeping the student's attention and being aware of their needs, classroom management, grading and evaluation are among the skills that can be taught by teachers [19].

A range of this professional skills further attest to the important role microteaching can play to the adequate professional training of teachers. Microteaching is often adopted as a strategy to initiate pre-service teachers into the practical world of teaching [2], because it allows student teachers to transform their subject matter knowledge and pedagogical content knowledge into practice [24]. This importance of microteaching is further stressed in literature to improve student teachers lesson planning [32-33], student teachers communication [21], content knowledge [22], use of teaching aids [34-35], and classroom organization [20].

A review of studies on microteaching international reveals that most of the investigation centered on investigating student teachers experiences of microteaching on a number of subject areas [19], [2], [22], [30], effectiveness of microteaching on mathematics [24] and the effectiveness of microteaching on the opinion pre-service teachers [23]. In Nigeria, previous research on micro-teaching as a predictor of teaching

performance of Biology teacher trainees in Akwa Ibom State College of Education [11]. The researchers adopted the ex post facto research design which involved 123 students randomly selected from the final year students between 2010/2011 and 2012/2013 sessions. The findings from their study shows that there was a positive relationship between the performance of Biology teacher trainees in micro-teaching and teaching practice.

Previous research investigated the effectiveness of video tape recorder on micro-teaching and student teachers practice of stimulus variation skills [36]. The researchers found out that video tape recorder had significant effect on the performance of pre-service teachers. In the investigation carried out by previous research [37], it's investigated the impact of micro-teaching video feedback on student teachers performance in teaching practice. The researcher found out that student teachers taught using micro-teaching video achieved better in teaching practice score when compared to students not taught using micro-teaching. In a more recent studies, previous research investigated the impact of micro-teaching in developing teaching skills among pre-service teachers [38]. The researcher used a sample of second year 90 student teachers in Alvan Ikoku College of Education. The findings from their study revealed that micro-teaching had positive effect on teaching skills.

Teaching practice, the practical aspect of teaching is an important aspect of teacher preparation for the teaching profession since it provides for real interface between student hood and membership of the profession. It is a major phase of teacher training because it represents the range of experiences to which student's teachers are exposed when they work in classrooms and schools [39]. This suggests that teaching practice is a bridge that links student's teachers to real life classroom situation while still a student and when they finally graduate to become professional teachers. The experiences that student teachers have early in their teaching career can go a long way in deciding what they would become in the profession. Mokoena opined that teaching practice offers student teachers the opportunity to learn and develop as professional teachers along the dimensions of pedagogical knowledge, subject matter knowledge, pastoral knowledge, ecological knowledge, inquiry knowledge and personal knowledge [29]. This assertion further emphasizes that teaching practice is an encompassing exercise which tends to develop a teacher trainee to becoming a complete teacher.

Kiggundu and Nayimuli defined teaching practice as a form of work integrated learning that involves the period of time students work in relevant industry to receive specific in-service training in order to apply theory to practice [26]. It suffice to say that teaching practice is an integral component of teacher training [17] which plays an essential role in the complete professional training of a would-be teacher. It is an exercise that usually occurs in the penultimate level after teacher trainees have been exposed to the basic courses on the teaching profession. During this periods, students take a lot of courses ranging from introduction to teaching professions, philosophy in education, psychology in education and also the methods courses.

A review of studies on teaching practice revealed that student teachers experiences of teaching practice have been assessed especially at a distance learning institution level [29]. Studies in Nigeria also revealed that student teacher's performance during teaching practice have been assessed [27]. Previous study investigated if teaching practice effectively prepare student teachers to teach Creative and performing Arts in Bostwana [40]. The researcher employed a qualitative case study which involved three Colleges of Education in South East, Bostwana and a total number of fifteen third year student teachers and ten teachers were involved in the study. Finding from their study showed that student

teachers were taught the general pedagogical skills of teaching in primary schools though by teachers who are not specialist in Arts. Likewise in Tanzania, a research on undergraduate student teachers teaching practice experience in Sokoine University of Agriculture, Tanzania was done [28]. The researchers employed a qualitative research method which involved 351 second and third-year undergraduate student teachers. The revealed that student teachers sees teaching practice as a crucial aspect to learning the ability to teach professionally. The study also found out that lack of funds and the inadequate matching of teaching practice period with school's calendar are parts of the problems confronting the proper conduct of teaching practice.

In Nigeria, a study assessed 222 student teachers' performance on teaching practice in the Faculty of Education, Ekiti State University, Nigeria [27]. The researchers reported that students performed well in teaching practice probably because they were formally induced on the importance of teaching practice to teacher education. Ikitde and Ado assessed student's attitude towards teaching practice exercise in the Faculty of Education, University of Uyo [41]. The researchers adopted the survey design which involved a total number of 163 student teachers. The results from their study revealed that student teachers have a negative attitude towards teaching practice and that student teachers differ in their attitudes towards teaching practice.

The reviewed literature shows that micro-teaching and teaching practice have being investigated in creative and performing arts, Biology, stimulus variation skills, Agricultural Science, use of Information Communication and Technology (ICT) and in the area of teacher trainee's attitude. The literature available to the researchers reveals that there is little or no study on the performance of physics teacher trainees on teaching practice as predicted by their scores in micro-teaching. This study therefore sought to fill this gap in the literature by providing an empirical evidence of the capacity of physics teacher trainees' performance in microteaching to adequately predict of physics teacher trainees performance in teaching practice.

This paper adopted constructivism as its theoretical framework. The work of Vygotsky theory of social constructivism emphasize learning by getting involved in the construction of knowledge [42]. The theory asserts that active engagement assists learners in the construction of knowledge. The cohort of physics teachers in-training used in this investigation have been adequately prepared to become professional trained teachers through the taking of different courses as specified in the curriculum for teacher education. The data of the cohort of students used in this investigation have taking course in microteaching before proceeding for teaching practice in their respective final years. The role of teacher/lecturer in this aspect of the teaching process becomes that of a facilitator during microteaching course and a supervisor during the teaching practice exercise.

## 2. METHOD

This paper is a quantitative study which adopt the ex post facto research design because the events that generated the data used had already taken place. An ex post facto design imitates a true experiment in that it makes comparisons between individuals who belong to different groups but have identical backgrounds and different prevalent conditions which are a direct function of their natural histories [43]. This study used data from a teacher training college in Ondo, Nigeria.

The sample for the study were a cohort of final year Bachelor of Education students in the Department of Physics, in the last four sessions of 2015/2016 and 2018/2019. Only Physics Education students who have corresponding scores in micro-teaching course and teaching practice course were involved in this study. The moderated and approved scores

of Physics Education students in microteaching was obtained through written permission to the Coordinator, Centre of Educational Technology (CET) while the moderated and approved scores of Physics Education students in teaching practice was obtained through written permission to the Dean, School of General Education (SGE). All the scores of Physics Education students in the last four sessions were used for this study because the total number was not too large hence, the scores of 638 students were used.

The data collected from the Coordinator CET and the Dean SGE, were analysed using descriptive and inferential statistics. Pearson Product Moment Correlation Coefficient (PPMC) and Mean and standard deviation were used to provide answer to the research question while t-test was used to test the null hypothesis for acceptance or otherwise.

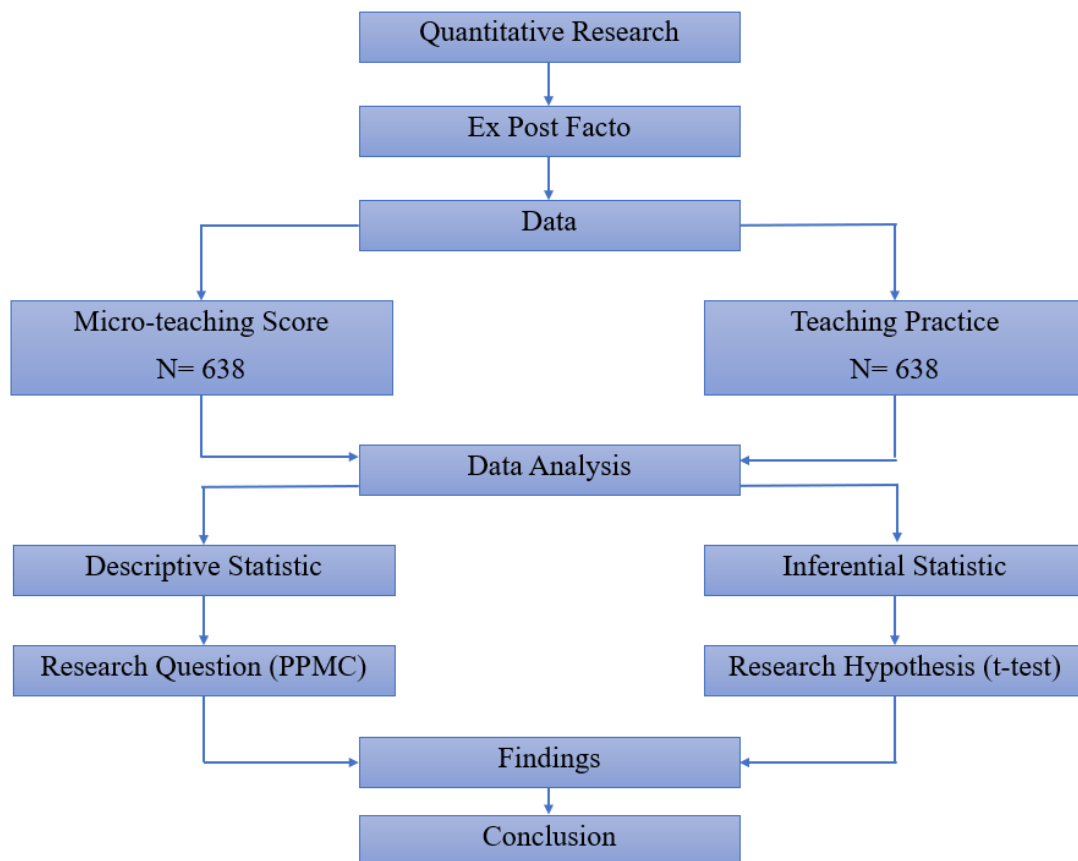


Figure 1. Flowchart for the Study

### 3. RESULTS AND DISCUSSION

Research Question: What is the relationship between the performance of physics teacher trainees in micro-teaching and teaching practice?

Table 1. Relationship Between Performance of Physics Teacher Trainees in Micro-teaching and Teaching Practice

Variable	Mean ( $\bar{X}$ )	Standard Deviation	R
Micro-Teaching (MT)	62.48	8.69	0.448
Teaching Practice (TP)	62.43	4.84	

Table 1 shows the relationship between the performance of physics teacher trainees in microteaching and teaching practice. Table 2 reveals that the Pearson Product Moment Coefficient value of 0.448 was obtained. This implies that a moderate positive relationship

exist between the performance of physics teacher trainees in microteaching and teaching practice. The result from Table 1 shows that performance of physics teacher’s trainees in micro-teaching course, which is a prerequisite module/course for teaching practice moderately reflects the performance of physics teacher’s trainees in teaching practice. Despite the limitation that the scores that make up the performance of physics teacher’s trainees in micro-teaching and teaching practice were graded by different teachers/lecturers, the overall mean performance scores of the two groups reflects a moderate relationship. What might be responsible for this moderate relationship could be the objective mode of assessing the two modules/courses (micro-teaching and teaching practice). This finding implies that there is a correlation between what pre-service physics teachers learnt in theory (micro-teaching) and what they displayed during teaching practice.

Research Hypothesis: There is no significant difference between the performance of physics teacher trainees in microteaching and teaching practice.

**Table 2.** Physics Teacher Trainee’s Performance in Microteaching and Teaching Practice

Variable N	N	X	Std	df	t	Sig.	Remarks
Micro-teaching	638	62.48	8.69	1274	0.13	0.89	NS (Not Significant)
Teaching Practice	638	62.43	4.84				

Table 2 shows the t-test analysis of the performance of physics teacher trainee in microteaching and teaching practice. Table 2 reveals that the t-test value of 0.13 was obtained at a significant level of 0.89. Since the calculated value of 0.89 is greater than the alpha value of 0.05, the research hypothesis is hereby accepted. This implies that there is no significant difference between the performance of Physics teacher trainee in microteaching and teaching practice.

The findings from the research question revealed that there is a moderate positive relationship between the performance of physics teacher’s trainee in microteaching and teaching practice. This implies that physics teacher trainees who moderately performed in microteaching also moderately performed in teaching practice. What might be responsible for this result could be that the teaching skills acquired by the teacher trainees during their participation in microteaching assisted them in performing well during teaching practice exercise. This finding agrees with previous research which found a positive relationship between the performance of Biology teacher trainees in microteaching and teaching practice [11]. The result from this study aligns with the principles of Vygotsky theory because the active engagement between physics teacher trainees and lecturers assist in the construction of knowledge which can be latter used by teacher trainees in their teaching career.

The findings from the hypothesis revealed that there is no significant difference between the performance of physics teacher trainee in microteaching and teaching practice. This implies that the scores obtained by physics teacher trainees in microteaching might just be a true reflection of their capabilities as also reflected in their scores in teaching practice. This result also agrees with knowledge construction as opined by Vygotsky theory. The series of engagement during the teacher training program especially the offering of micro-teaching course and teaching practice exercise allows for the construction of knowledge by the students who happens to be the teacher trainees. This finding disagrees with the finding of previous research which found a significant different in the microteaching scores and the performance of pre-service teachers in teaching practice [36]. The finding however agrees with previous findings which revealed that microteaching had positive effect on teaching skills [38]. This implies that physics teacher



trainees' scores in teaching practice is proportional to the scores they achieved during microteaching exercises.

The implication of this study is that there is a moderate relationship between theory and practice in the teacher education program provided to physics teacher's trainees in the College of Education used in this study. This finding also implies that there is relatively permanent change in the behaviour of physics teacher trainees as a result of instructions received from their teachers/lecturers. It can therefore be concluded that meaningful learning has taking place. The outline of topics taught physics teacher trainees during their professional training moderately reflects the skills they display during the actual teaching practice exercise. This speaks great volume to the quality of education program going on in the sampled College of Education.

#### 4. CONCLUSION

The findings from this study revealed that the difference between the performance of physics teachers' trainees is not significant suggesting that pre-service teacher's performance in microteaching predicts their performance during teaching practice. This suggest that scores obtained by physics teacher trainees in microteaching is closely related to the scores later obtained during the teaching practice exercise. This study conclude that microteaching performance viably predicted the performance of physics teacher's trainees in teaching practice. The performance of physics teacher's trainee during teaching practice can go a long way in determining how successful they will be when they finally qualify as professional teachers. Based on the findings from this investigations, the following recommendations were considered appropriate:

- 1) Lecturers who teach method courses should be encouraged to take the aspect of microteaching seriously so as to guarantee good performance of physics teacher trainee's during teaching practice.
- 2) Lecturers who handle teaching method courses should be encouraged to attend seminars, workshops and technical sessions by their institutions in order to keep them abreast of the best practices in teacher education especially as it affect the production of professionally trained teachers.
- 3) Lecturers should be encouraged to sensitize their students on the need to take microteaching exercise seriously irrespective of their areas of specialization, bearing in mind that student's performance during microteaching will go a long way to determine their performance during the actual teaching practice exercise, which is also a great pointer to becoming a good and professionally trained teacher.

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