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Impact of Microteaching Skills on College of Education Student-Teachers' Performance in Teaching Biology during Teaching Practice in Kwara State, Nigeria

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Abstract

This study investigated the impact of micro-teaching skills on College of Education student-teachers' performance in teaching Biology during teaching practice in Kwara State, Nigeria. The study was guided by four specific objectives, four research questions answered using percentages, mean and standard deviation and two hypotheses which were tested at 0.05 level of significance. The study adopted ex-post facto research design. The study was carried out on a population size of 2321 and a sample size of 374 which was determined using Taro-Yamane formula of finite population. Multi-stage sampling technique was used for the study because each stage involves different sampling techniques. The instruments used for data collection were a proforma and a structured questionnaire developed by the researcher. The questionnaire was validated by three experts and trial-tested on students in College of Education, Oju Benue state. Data obtained were subjected to a reliability test using

Cronbach alpha method. The result yielded a grand reliability coefficient of 0.84 indicating that the instrument was reliable for the study. The questionnaire was administered and retrieved by the researcher who also collected the proforma. Data were analyzed using descriptive statistics of mean and standard deviation to answer the research questions while t-test was used to test the hypotheses. The study revealed that microteaching has an impact on the performance of Biology student-teachers in teaching practice exercise. The study also revealed that there is impact of microteaching on teaching practice scores of Biology students irrespective of gender (male and female) in Colleges of Education in Kwara State. The study concluded that microteaching positively impacts the teaching skills of Biology students in Colleges of Education in Kwara State, with a gender-neutral effectiveness, hence, recommended integrating microteaching consistently into the teacher education curriculum in Colleges of Education in Kwara State to enhance the teaching skills of Biology Education students, while encouraging further research to explore its applicability in diverse educational settings.

Keywords: Biology Education, Student-Teacher, Microteaching, Microteaching Practicum, Teaching Practice, Colleges of Education

Introduction

Education is one of the important areas where governments in both developed and developing economies direct its resources. It serves as a pivotal force in societal transformation, directing resources towards human, social, economic, and cultural development (UNESCO, 2018). Recognized as indispensable for equitable and prosperous societies, education empowers individuals and fuels sustainable development (UN, 2018). Particularly in science and technology, education fosters innovation and progress (Ebuka, 2014). In Nigeria, the significance of science education, including Biology, is underscored as a driver of industrialization and economic growth (Adejoh & Apochi, 2018). Despite its importance, student achievement in Biology at the Colleges of Education (COE) in Nigeria has been inconsistent, potentially jeopardizing the nation's technological aspirations (Ahmed, 2018). Several factors contribute to this, including overloaded curriculum, uninspiring teaching methods and teacher characteristics (Osborne & Collins, 2015; Adetunji, Oloyede, Bamidele & Bada, 2015).

Teachers play a central role in educational effectiveness, serving as key facilitators of learning (Ashimole, 2014). The quality of education hinges on teacher competence and professionalism (Fenstermacher & Richardson, 2015). Teacher education programs are essential for equipping teachers with the requisite knowledge and skills (Onocha, 2018). Both pre-service and in-service training are crucial for ensuring teachers are adequately prepared to meet the demands of the profession (Farooq & Shahzadi, 2016). Microteaching, a subset of teacher education, bridges theory and practice, allowing student-teachers to develop essential teaching skills (Ike, 2015). However, challenges such as poor educational policies and inadequate resources hinder the effectiveness of microteaching programs (Agugbuem, 2016). Despite its potential, the gap between theory and practice persists, impacting student-teachers' ability to effectively apply their skills during teaching practice (Ijaiya, 2015).

Teaching practice serves as a crucial component of teacher education, providing student-teachers with real-world teaching experiences (Amuda, 2017). Performance during teaching practice is indicative of future teaching success and is evaluated through various means, including observations and student assessments (Muraina, 2017). However, concerns arise regarding student-teachers' ability to translate theory into practice, particularly in demonstrating teaching skills acquired through microteaching (Joe, 2019). The discrepancy between expected and actual performance highlights the need for interventions to enhance teaching effectiveness during practice (Ijaiya, 2015). Understanding the impact of microteaching skills on student-teachers' performance in biology teaching practice is crucial for addressing this gap and improving educational outcomes (Ijaiya, 2015).

Biology as one of the science subjects offered in COE deals with the scientific study of living things, their relationship with one another, and with the natural environment among other things (Akanbi & Kolawole, 2014). It plays a key role in industrialization and other sectors of the economy. It is a prerequisite subject for many fields of learning that contributes immensely to the technological growth of the nation (Ahmed, 2018). This includes medicines, pharmacy, nursing, agriculture, forestry, biotechnology, nanotechnology, and many other areas (Ahmed & Abimbola, 2014). It is a practical based subject, which equips students with concepts and skills that are useful in solving the day-to-day problems of life. According to the Nigerian Educational Research and Development Council – NERDC (2009), the study of Biology aims at equipping the learner with knowledge, skills and attitudes that are necessary for controlling and preserving the environment; enables the learner to appreciate man as part of the broader community of living organism; is a foundation for careers in health, agriculture, environment and education; and the precursor of biotechnology which is a tool for industrial and technological development. The knowledge of Biology has enabled researchers to develop high yielding disease-resistant and fast maturing food crops and animals to meet the food requirements of an ever-increasing world population (Adejoh & Ekele, 2014).

Despite the importance and popularity of Biology among Nigerian students, the achievement of students at senior secondary school level has been fluctuating at very low rates (Ahmed, 2018). The Benue State Ministry of Education (2017) also confirmed this decline and fluctuation in Biology achievement by students in their West African Senior School Certificate Examination (WASSCE) result reports of 2016 and 2017. The implication of students' low interest and achievement in Biology is that Nigeria may have shortages of manpower in science and technology-related disciplines. This may affect Nigeria's vision to become one of the industrialized nations in the world.

Various factors have been put forward by researchers to be responsible for the decline in interest and consequent low and fluctuating achievement among students in science and Biology in particular. For instance, Osborne and Collins (2015) posited that students' diminishing interest in learning science is due to the curriculum content being overloaded and not generally related to working life, the lack of discussion of topics of interest, the absence of creative expression opportunities, the alienation of science from society and the prevalence of isolated science subjects. Other factors identified were the

inappropriate, uninspiring and non-innovative teaching methods and strategies adopted by teachers and most significantly, teacher characteristics in terms of qualification and professionalism (Adetunji, Oloyede, Bamidele & Bada, 2016).

During teacher training, one very important activity that is usually carried out is microteaching. Microteaching is the process by which student-teachers are allowed to put their training into practice before students in a much-controlled environment (Edeanyi 2015). Microteaching serves as a meeting point between the theory and the practice for pre-service training of teachers. Ike (2015) believed that microteaching was developed as an answer to the question of how best teachers can be prepared for the teaching profession. It is when student-teachers acquire the necessary teaching skills through microteaching that they are posted to the field for teaching practice in Biology. Microteaching which is a sub-set of educational technology is an indispensable innovation in teacher education and preparation of pre-service teachers. This explains why student-teachers take courses in microteaching such as Micro-Teaching Theory and Micro-Teaching Practicum before they are deployed for teaching practice (Abah, 2016). This shows the importance of microteaching in teachers' preparation. The general idea about microteaching is to acquire teachings skills.

Teaching skills are necessary tools teachers should possess for effectiveness in their job. During micro-teaching teacher trainees acquire a lot of skills, experience and knowledge pertaining to teaching. Sabon and Coklar (2013) were of opinion that in micro-teaching, pre-service teachers should find opportunities to develop skills to prepare lesson plans, choose teaching goals, take students' attention, speak in front of group, ask questions, managing time effectively, and assessment techniques. In addition, microteaching assist teacher trainees with skills which is capable of helping them to do away with fear of actual teaching. Remesh (2013) identified micro-teaching as a technique for personality development and confidence-building of student-teachers. However, micro-teaching helps not only in developing skills of the novice teachers but also assists in comparing the effectiveness of variation of one microteaching with another.

Unfortunately, microteaching that is supposed to be a training ground for the adequate teachers' preparation is marred by lack of equipment and instructional resources, ill-equipped staff and lack of infrastructural facilities. Agugbuem (2015) noted that adequacy and efficiency of microteaching as a teacher training technique requires a review because Education programmes by Nigerian Universities and Colleges of Education do not adequately prepare teacher trainees for real classroom teaching effectiveness. According to Can (2019), the more effective the microteaching the better the opportunities for student-teachers to develop their teaching skills at their schools of practice. This is because microteaching exercise serves as training ground for teaching practice.

Teaching practice can be said to be the practical act of learning to impart knowledge. Teaching practice is a compulsory course for all aspiring teachers registered in a teacher preparation programme in Nigeria (Abah, 2016). Teaching practice exercise is like houseman-ship in Medicine and Student Industrial Work Experience Scheme (SIWES) for

engineers and Court Attachment for Lawyers (Nnenna & Olanrewaju, 2015). A meaningful teaching practice is expected to include microteaching and field teaching experiences (Amuda, 2017). This assertion implies that microteaching is a component of teaching practice because its experiences will help the teaching practice students to acquire knowledge and skill in coping with classroom situation after their graduation. As part of the package, teaching practice is allocated specific period of time during which student-teachers are sometime posted to schools to teach and demonstrate in practical terms the knowledge and skills they had acquired during the third or fourth years of training while some universities usually require their students to choose the school of their choice. This is to ensure that the student-teachers have adequate time to practicalize all they have learnt over the years in their teacher training career. In order to be graded for the course (Teaching Practice), student-teachers are assessed based on their level of performance.

Performance from the context of this study refers to the effectiveness and proficiency of educators in carrying out their teaching responsibilities. Performance in teaching is often evaluated through teacher observations, student assessments, peer reviews, and other forms of evaluation. Performance of teaching practice exercise provides basis for predicting the future success of the teacher. The entire process involved in teaching practice exercise is an important contributing factor towards the quality of teacher Education programme. During teaching practice exercise, interaction with students in the school provides a high degree of emotional stability within the student-teachers because such process of socialization enables the student teacher to gain experience by linking to a culture of teaching and also feeling engaged, challenged and even empowered (Trowbridge & Bybee, 2014). It should therefore be noted that going into teaching profession without undergoing teaching practice exercise could result in future poor performance depending on several factors which include gender peculiarities. Gender here simply refers to both male and female Biology student-teachers who are also the respondents in this study.

However, from the researcher's experience, student-teachers in Colleges of Education in Kwara State, Nigeria, often seem to be mainly concerned and interested in the evaluation (grade) aspect of the teacher education and training. It also appears that student-teachers are not performing very well in teaching practice; this may be connected to lack of micro-teaching skills during their pre-service training. Micro-teaching is seen as providing an opportunity to translate theory into practice in a real teaching setting (Joe, 2019). Due to this importance, more attention is being given to teacher education so that adequate manpower can be produced for the school system and the larger society. It is clear that student-teachers in teaching practice exercise are exposed to official skills of micro-teaching, while in teaching practice they are assessed based on both the official and unofficial skills, and so this yields a gap between theory and practice.

Based on this, Ijaiya (2015) noted that many student-teachers fail to acquire enough teaching skills to the detriment of pupils' learning. This might not be unconnected to lack of enough time and training for the student-teacher to capture the skills effective during teaching and learning. Even if some of these skills are learnt by the student during pre-service training, it seems that most of the student-teachers are not applying these skills

during teaching practice. The student-teachers go to the classroom without instructional material; most of them fail to demonstrate the skills of reinforcement and also the skill of closure to round up the lesson and so on. It is on this basis that this study is being carried out to determine the impact of microteaching skills on student-teachers' performance in teaching Biology during teaching practice in colleges of Education in Kwara State of Nigeria.

Statement of the Problem

Micro- teaching is the first stage of training any student teacher will attend/indulge in before practicing teaching in a real classroom situation. Microteaching was introduced to enhance student-teachers' performance during teaching practice. The performance of student-teachers during micro-teaching matters a lot as it may determine the outcome of the task ahead, which is why it is a prerequisite for teaching practice.

Measuring the impact of micro-teaching skills on teaching practice performance is a complex task, as numerous variables such as gender can influence outcomes. Establishing a clear relationship between micro-teaching and teachers' performance in Biology is challenging while resource constraints and ethical considerations on the other further complicate the teacher training processes. Moreso, absence from classes, laziness to develop a lesson ahead of class, and inability to take corrections on the part of student-teachers have all been observed to contribute to poor performance of student during micro-teaching which will in turn affect their performance during teaching practice exercise.

However, the importance of addressing the issues surrounding microteaching and its impact on teaching practice underscores that entering the teaching profession without undergoing effective microteaching and teaching practice experiences could lead to poor performance as educators. Therefore, the study was initiated to investigate the impact of micro-teaching skills on student-teachers' performance in teaching Biology during teaching practice in colleges of Education Kwara State, Nigeria, with the ultimate goal of improving the quality of teacher education and enhancing the preparedness of future educators.

Research Questions

The following research questions guided the study:

i. what are the skills acquired by Biology students during microteaching exercise in colleges of Education in Kwara State?
ii. what is the impact of microteaching on student-teachers' performance in teaching Biology during teaching practice in Kwara State?
iii. what is the impact of microteaching on male and female student-teachers' performance in teaching Biology during teaching practice in Kwara State?

Research Hypotheses

The following hypotheses were formulated and were tested at 0.05 level of significance.

i. Microteaching does not have any significant impact on student-teachers' performance in teaching Biology during teaching practice in Kwara State.

ii. There is no significant difference between the impact of Microteaching on male and female student-teachers' performance in teaching Biology during teaching practice in Kwara State.

Methodology

The study adopted ex-post facto research design. Ex-post facto design was used because it permitted the researcher to use the variables as they occur without their manipulations. The study was carried out in Kwara (Yoruba: *Ìpínlẹ̀ Kwárà*). Kwara is a State in North Central Nigeria with Ilorin as its capital. The population of the study comprised 2321 students studying Biology Education in the fifteen Colleges of Education in Kwara State (NCCE, 2023). This population is made up of NCE III students of Biology Education in both the three public and eleven private colleges of Education in Kwara State, Nigeria. The sample size was 374 respondents gotten by the use of Taro-Yamene formula of finite population. The study adopted multi-stage sampling technique.

The instruments for data collection were Impact of Microteaching Skills on Student-teachers' Performance in Teaching Biology during Teaching Practice in Colleges of Education Questionnaire (IMSTEPT) developed by the researcher while the second instrument is a proforma named "MICROTPRO". The instruments were validated by three experts. The data obtained were subjected to a reliability test using Cronbach alpha method. The result yielded reliability coefficients of 0.84 while the checklist on microteaching skills was face validated.

Descriptive statistics of frequency counts and percentages was used to answer research question one while mean and standard deviation was used to answer the research questions two and three respectively. T-test was used to test the hypotheses at 0.05 level of significance.

Results

Results of the study are presented according to research questions posed.

Research Question One

What are the skills acquired by Biology students during microteaching exercise in colleges of Education in Kwara State?

Table 1: Skills acquired by Biology students during microteaching exercise in colleges of Education in Kwara State

S/N	Skills Acquired During Microteaching Exercise	Acquired		Not Acquired	
		Frequency	%	Frequency	%
1	Lesson Planning	374	100	-	-
2	Classroom Management	374	100	-	-
3	Time Management	374	100	-	-
4	Communication	374	100	-	-
5	Questioning Techniques	374	100	-	-
6	Active Listening	374	100	-	-
7	Feedback	374	100	-	-

8	Differentiation of instruction	300	80.2	74	19.8
9	Use of Technology	-	-	374	100
10	Instructional Materials	374	100	-	-
11	Classroom Engagement	374	100	-	-
12	Adaptability	374	100	-	-
13	Clarity of Explanation	374	100	-	-
14	Use of Visual Aids	374	100	-	-
15	Classroom Assessment	374	100	-	-
16	Classroom Environment	374	100	-	-
17	Reflective Practice	320	85.6	54	14.4
18	Classroom Communication	374	100	-	-
19	Lesson Delivery	374	100	-	-
20	Behavior Management	374	100	-	-
21	Chalkboard utilization	374	100	-	-
22	Set induction	374	100	-	-
23	Reinforcement	374	100	-	-
24	Writing instructional objectives	374	100	-	-
25	Stimulus variation	374	100	-	-

The results in Table 1 showed that 100% of the respondents agreed that Lesson Planning, Classroom Management, Time Management, Communication, Questioning Techniques, Active Listening and Feedback were skills acquired during microteaching practice. Also, 80.2% agreed on the acquisition of Differentiation of instruction as skills during teaching practice while 19.8% never acquired the skill. Consequently, 100% of the respondents agreed on the acquisition of Instructional Materials, Classroom Engagement, Adaptability, Clarity of Explanation, Use of Visual Aids, Classroom Assessment and Classroom Environment while 100% opined that the Use of Technology as skills during microteaching practice was never acquired.

Conversely, 85.6% agreed on the acquisition of Reflective Practice as skills during teaching practice while 14.4% never acquired the skill. Also, 100% of the respondents agreed on the acquisition of Classroom Communication, Lesson Delivery, Behavior Management, Chalkboard utilization, Set induction, Reinforcement, Writing instructional objectives and Stimulus variation.

Research Question Two

What is the impact of microteaching on student-teachers' performance in teaching Biology during teaching practice in colleges of Education in Kwara State?

Table 2: Mean and standard deviation of the impact of microteaching on student-teachers' performance in teaching Biology during teaching practice

Variable	N	Mean	Standard deviation	Mean Diff
Non- Micro-teaching	374	49.80	0.48	

Micro-teaching	374	95.25	0.45	**45.45**

In Table 2, the result showed the mean performance scores of students in teaching practice and micro-teaching. The result showed that in the teaching practice mean scores of 49.80, while the microteaching mean score of 95.25. The mean difference score of 45.45 indicating that microteaching has no impact student-teachers' performance during teaching practice.

Research Question Three

What is the impact of microteaching on male and female student-teachers' performance in teaching Biology during teaching practice in colleges of Education in Kwara State?

Table 3: Mean and standard deviation of the impact of microteaching on male and female student-teachers' performance in teaching Biology during teaching practice in colleges of Education in Kwara State

Gender							Mean gain
	Male	$\bar{X}$	SD	Female	$\bar{X}$	SD	
Micro-teaching	174	29.40	0.18	200	65.85	0.39	36.45
Non- Micro-teaching	174	10.40	0.45	200	39.40	0.66	29.00
Mean difference		19.00			26.45		07.45

The result from Table 3 showed that in the Micro-teaching scores of Male and Female students with a mean and standard deviation of 29.40 and 0.18 for male and 65.85 and 0.39 for female while the teaching practice result revealed a mean of 10.40 and SD of 0.45 for male and female had a mean of 39.40 and SD of 0.66. The mean difference for male in microteaching and teaching practice was 19.00 while the mean difference for the female is 26.45. This result shows that microteaching had greater impact on the female students teaching practice delivery than the male students.

Research Hypothesis One

Microteaching has no significant impact on student-teachers' performance in teaching Biology during teaching practice in Kwara State.

Table 4: Summary of one sample t-test on the impact of micro-teaching on the performance of student-teachers in teaching Biology in Kwara State

Variable	**N**	**Mean**	**SD**	**t-cal**	**df**	**t-crit**	**P-value**	**Decision**
Microteaching	374	95.25	0.45	1,358.2	372	1.96	.000	Rejected
Non- Micro-teaching	374	49.80	0.48					

Table 4 showed the performance mean score of 95.80 and standard deviation of 0.45 for microteaching while 49.80 and 0.48 for teaching practice respectively. The t-cal is 1,358.2

and t-crit is 1.96, while the p-value is 0.000 (P<0.05). Subsequently, the null hypothesis which states that micro-teaching has no significant impact on the teaching practice performance of student-teachers teaching Biology in Kwara State is hereby rejected. This means that micro-teaching has impact on teaching practice performance of student-teachers teaching Biology in Kwara State.

Research Hypothesis Two

There is no significant difference between the impact of Microteaching on male and female student-teachers' performance in teaching Biology during teaching practice in Kwara State.

Table 5: Summary of one sample t-test on the impact on male and female student-teachers' performance in teaching Biology during teaching practice in Kwara State

Variable	N	Mean	SD	t-cal	df	t-crit	P-value	Decision
Female	200	65.85	0.18	866.7	372	1.96	.002	Rejected
Male	174	29.40	0.39					

Table 5 revealed that microteaching has impact on male and female student-teachers' performance in teaching Biology during teaching practice in Kwara State. The table showed the performance mean score of 65.85 and standard deviation of 0.18 for female student-teachers while 29.40 and 0.39 for male student-teachers respectively. The t-cal is 866.7 and t-crit is 1.96, while the p-value is 0.002 (P<0.05). Subsequently, the null hypothesis which states there is no significant difference between the impact of Microteaching on male and female student-teachers' performance in teaching Biology during teaching practice in Kwara State is hereby rejected. This means that microteaching impact female student-teachers' performance in teaching Biology during teaching practice more than male student-teachers.

Discussion

The outcome in Table 1 showed that Lesson Planning, Classroom Management, Time Management, Communication, Questioning Techniques, Active Listening, Feedback, Differentiation of instruction, Instructional Materials, Classroom Engagement, Adaptability, Clarity of Explanation, Use of Visual Aids, Classroom Assessment, Classroom Environment, Reflective Practice, Classroom Communication, Lesson Delivery, Behavior Management, Chalkboard utilization, Set induction, Reinforcement, Writing instructional objectives and Stimulus variation were acquired by Biology student-teachers during microteaching exercise while Use of Technology was not acquired. By implication, 24 skills being acquired against 1 showed that student-teachers actually acquire microteaching skills before proceeding for teaching practice. This finding is in line with the finding of Kilic (2020), who argued that teachers are more than transmitters of information like periodicals, course books and information sheets. Teachers are facilitators in learning process and in creating learning-conducive environment. To do this efficiently, teachers need some skills in teaching. These skills are used for training student-teachers, and they are referred to as micro-teaching skills. The numbers of micro-teaching skills depend on the authors or

educators. In line with this assertion, Arikya (2020), identified thirteen (13), teaching skills. These are: writing instructional objectives, set induction, fluency in questioning, probing questions, explanation, illustration with examples and stimulus variation. Others include silence and non-verbal cues, reinforcement, learners' participation, chalkboard utilization, recognizing and attending learners' behaviour and closure.

This study is in line with the study of Akanbi and Usman (2014), who were of the view that microteaching assist teacher trainees in acquiring teaching skills such as building confidence, reduction in anxiety and fear, proper class management, selection of teaching goals, preparation of lesson plan, ability of speaking in front of group. This is similar to the study of Sabon and Coklar (2013) who found out that microteaching is assisting undergraduate students in developing teaching skills, confidence, reduction in the level of their anxiety and fear, ability of managing classes, selecting proper teaching goals, preparing good lesson plan, ability to speaking in front of group as well as selection of appropriate instructional materials and proper time management.

Sonmez (2014) was of the view that micro-teaching is an excellent way to build up skills and confidence, to experience a range of lecturing/tutoring styles and to learn and practice giving constructive feedback. Remesh (2015) was also of the view that micro-teaching help pre-service teachers develop an awareness of classroom dynamics and pre-service teachers' observation skills as well as their ability to notice what is happening in the classroom environment. Aggarawal (2016) discovered that micro-teaching gives instructors an opportunity to safely put themselves "under the microscope" of small group audience, but also to observe and comment on other people's performances. No wonder, Undiyaundeye and Inakwu, (2014) were of the opinion that micro-teaching is one of the recent innovations in teacher Education programme which aims at modifying teachers' behavior according to modified objects.

The findings presented in Table 2 showed teaching practice mean scores of 49.80, while the microteaching mean score of 95.25 with mean difference score of 45.45 indicated that microteaching has impact on student-teachers' performance during teaching practice. Conclusively, students tend to excel more in teaching practice when they are equipped with microteaching skills. This implies that microteaching have no impact on student-teachers' performance during teaching practice exercise. The findings presented in this study align closely with the research conducted by Nikazraini (2018), which concluded on the contrary that students exhibit a notably higher level of perception towards traditional teaching practices in when they are conversant with microteaching. Nikazraini's work, as referenced in this study, highlights an interesting phenomenon where students seem to perform better in teaching practices because of the skills they acquired during microteaching. This class-to-field experience as revealed by the author form the basis for success after school. This finding underscores the importance of microteaching for effective performance in teaching practice. It also raises questions about the effectiveness of microteaching as a pedagogical tool and how it truly reflects the realities of actual classroom teaching. The correlation between these studies highlights the ongoing evolution and adaptation of teaching methodologies and calls for a continued exploration of innovative ways to enhance the learning experience for student-teachers.

The findings of the present study negate the research conducted by Omole and Ajileye (2020) where their investigation also unearthed that student-teachers exhibited a positive attitude towards teaching practice. In their study, Omole and Ajileye underscored the belief among student-teachers that engagement in microteaching served as a crucial mechanism for building their teaching competences. This shared perspective reinforces the idea that microteaching holds immense value within teacher education programs, as it is perceived by aspiring educators as a dynamic platform for enhancing their professional skills and capabilities. The positive attitude expressed by student-teachers towards teaching practice suggests that they view this practical experience as an opportunity to bridge the gap between theoretical knowledge and real-world classroom application. The correlation between the current study and the work of Omole and Ajileye highlights the consensus among student-teachers regarding the pivotal role of microteaching in teaching practice and their professional development as educators.

The data presented in Table 3 demonstrated a substantial positive impact of microteaching on subsequent teaching practice, particularly when examining the mean scores and gain differences for both male and female students. In the realm of microteaching, male students demonstrated a mean score of 29.40, with a subsequent mean gain of 19.00 when transitioning to teaching practice. Similarly, female students exhibited a notably higher mean microteaching score of 65.85, with a mean gain of 26.45 in teaching practice. These findings suggest that the microteaching sessions effectively equipped both male and female students with skills and insights that translated into improved performance during teaching practice exercise.

These results collectively indicate that the structured and targeted nature of microteaching sessions has a tangible and positive impact on subsequent teaching practice. The observed gains in both male and female students underscore the value of microteaching as a preparatory and developmental tool for educators, providing them with the necessary skills and confidence to excel in real-world teaching scenarios. The findings emphasize the importance of incorporating microteaching methodologies into teacher training programs, affirming its role in shaping effective and proficient teaching practices.

The findings are in support of the study carried out by Slabbert (2013) who aligns cohesively with the assertion that microteaching plays a crucial role in preparing educators for successful teaching practices. The structured and targeted nature of microteaching sessions, as highlighted in the initial findings, appears to have a tangible and positive impact on subsequent teaching practice. The observed gains in both male and female students during microteaching, followed by an enhanced performance in teaching practice, suggest that microteaching serves as a valuable preparatory and developmental tool. The positive outcomes underscore the efficacy of microteaching in providing aspiring educators with essential skills and confidence necessary for success in real-world teaching scenarios. The consistency of results across different studies, including the cross-institutional analysis by Slabbert (2013) further strengthens the argument in favor of incorporating microteaching methodologies into teacher training programs. The findings collectively emphasize the importance of this approach in shaping effective and proficient teaching practices.

The presented results from the Table 4 highlight the significant positive impact of microteaching on the subsequent teaching practice of both male and female students, emphasizing its role as a structured and effective preparatory tool. The mean gains observed in microteaching scores transitioning to teaching practice underscore the benefits of this approach. This aligns with the insights from Anderson, Bair and LaBaij (2012) who explored the impact of mentorship on teaching practice and found that both male and female students demonstrated improved performance when provided with mentorship. These complementary findings emphasize the importance of well-implemented microteaching and mentorship programs in creating a supportive and growth-focused environment for student-teachers. Together, these approaches contribute to shaping proficient and confident educators, challenging biases, and stereotypes, and promoting inclusive teacher development.

Conclusion

In conclusion, this study underscores the positive impact of microteaching on the performance of Biology students engaged in teaching practice exercises within Colleges of Education in Kwara state. The findings reveal that the method, which involves breaking down the teaching process into manageable components for practice and feedback, significantly enhances the overall teaching skills of students. Importantly, the study highlights that the benefits of microteaching are not influenced by gender, as both male and female Biology students demonstrated improvements in teaching practice scores. This gender-neutral effectiveness emphasizes the inclusivity of microteaching as a pedagogical tool for diverse student populations. However, it's crucial to acknowledge that these conclusions are specific to the context of Colleges of Education in Kwara State, Nigeria, and caution should be exercised when extending these findings to other regions or educational settings. Overall, the study provides valuable insights into the positive outcomes of microteaching in enhancing the teaching capabilities of Biology students, emphasizing its relevance in educational landscape.

Recommendations

Based on the findings of this study, it was recommended as follows:

i. To bridge the performance gap between microteaching and teaching practice, teacher education programs should provide more comprehensive training in microteaching skills for students in Colleges of Education in Kwara State.
ii. Encourage student-teachers to engage in reflective practice throughout their training. This can help them assess their strengths and weaknesses and make necessary improvements in both microteaching and teaching practice, contributing to their professional growth.
iii. Recognize and address the gender-based differences in performance observed in the study. Lecturers in the Colleges of Education should implement strategies to ensure that male and female student-teachers receive equitable support and resources, fostering an inclusive and supportive learning environment.
iv. Supervisors should implement a system of continuous assessment and feedback for student-teachers during their training. Regular feedback can help them

identify areas of improvement and work on their weaknesses, ensuring that they are well-prepared for teaching practice.

v. Supervisors should promote collaboration and mentoring among student-teachers. Encourage them to share experiences and insights, and pair them with experienced mentor teachers who can provide guidance and support during their teaching practice. This can help ease the transition from microteaching to real classroom settings.

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