IMPROVING TEACHING SKILLS OF PRE-SERVICE SCIENCE TEACHERS THROUGH ENHANCED MICROTEACHING

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ABSTRACT

Basic science and technology is an important aspect of science education to which students in junior secondary schools are exposed in order to acquire scientific literacy for systematic enquiry about life and their environment. However, it has been indicated in research that certain factors relating to students, teachers and school constitutes poor performance of basic education students. Of these, basic education teachers have been found to exhibit poor teaching skills in spite of investment in research and the efforts of teacher training institutions to produce teachers with relevant teaching skills. Therefore, this study attempted to improve the teaching skills of pre-service teachers through enhanced microteaching. The sample consisted of 37 pre-service teachers in part 2 {2020/2021 session} integrated science combinations in the school of science, College of Education, Ikere-Ekiti, Nigeria. An embedded experimental model of mixed method research with {QUANqual} notation was adopted. Blended Reflective Practice was used to train the pre-service teachers to enhance teaching skills in microteaching sessions. Data were collected quantitatively in one group pretest-posttest quasi-experimental design using Teaching Skills Rating Scale TSRS and qualitatively in interview sessions with pre-service teachers to support results from the intervention. T-Test statistics was computed to compare the mean difference between pre and post-tests to determine the influence of Blended Reflective Practice on pre-service teachers' teaching skills. The study concluded that Blended Reflective Practice is a vibrant pedagogical tool to enhance teaching skills in teacher training institutions in Nigeria and beyond.

KEYWORDS: Science and Technology, Blended Reflective Practice, Teaching.

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INTRODUCTION

The problem of teaching skills among basic education teachers in Nigeria is affecting the quality of the students produced at that level, and it is an issue to be carefully observed in order to find a lasting solution. Aina and Ayodele (2018) reported poor performance in Need Assessment Test which was to determine the mastery of subject matter and pedagogical knowledge among basic education teachers. Moreover, falsification of certificates to teach by this same set of teacher is a proof of poor preparation which will translate into poor achievement in basic education in Nigeria. It is not different from the submission of Odikwe and Nnakwe (2018) that educational aims and objectives without teachers with relevant teaching skills may be far from being achieved. Ige and Ogunseemi (2016) opines that the dynamic age requires that every teacher is confident of their teaching skills because teaching offers the chance to change other people's lives for the better. The previous is particularly relevant to the teaching of basic science and technology which should lay a foundation for a knowledge based society by scientific literacy and technological innovation through effective education systems. However, teacher education program is an aspect to be given the seriousness it deserves, especially microteaching sessions where pre-service teachers are equipped with basic concepts and principles to try out teaching steps and strategies in a dummy classroom. Microteaching   is   usually characterized by mentoring and monitoring with constructive feedback to improve teaching actions, and this is crucial for pre-service teachers to absorb the culture of teaching and more importantly, to develop and exhibit the basic teaching skills required for efficiency in real classroom.

REVIEW OF RELATED LITERATURE

Pre-service teachers training needs according to Jepketer, Kombo and Kyalo (2015) is to acquire the basic teaching skills, collaborate with colleagues in sharing pedagogical knowledge and teaching experiences in order to gain competencies and access to career opportunities in the teaching profession. The training for teaching skills should be considered a priority in teacher education programme because this will impart the pre-service teachers with the ability for effective teaching which will in turn guarantee an effective school system (Onwuagboke, Osuala & Nzeako, 2017). Teaching skills according to Reddy (2019) is lesson planning that is characterized of clear-cut objectives and an appropriate planned sequence within a specific time, also set induction which is the process of gaining the learners' attention from the beginning, stimulus variation in terms of gestures and clarity of voice to sustain the attention of learners. In addition, probing questions to help the learner to think in depth about the various aspects of the problem in order to understand the subject deeply, the use of audio-visual aids to simplify the teaching and as well stimulate the learners to learn and the skill of closure which is about the conclusion of a teaching session so as to bring out the relevance of what has been learnt, its connection with past learning and its application to the future. However, there is evidence in literature that microteaching is rigorous enough to train pre-service teachers for teaching skills but however, it is gradually dwindling in this role for obvious reasons. These can be confirmed from studies such as; Bilen (2015) who claimed that microteaching is an avenue for pre-service teacher to learn preparation and classroom management skills, and to acquire the required knowledge to overcome classroom related problems.

In another study, Al-Humaidi and Abu-Ramah (2015) discovered that pre-service teachers sometimes participates in microteaching just to satisfy the school requirements. Al-Takhyneh (2016) show that microteaching is a booster to thinking styles of pre-service teachers, while Kant (2017) submit that microteaching creates the platform for pre-service teachers to correct their mistakes as they train for teaching skills. In addition, studies by Damalie (2018) concludes that microteaching at times was not so effective and objective in the area of pre-service teachers' assessment on teaching skills. Ozcan and Gercek (2019) view microteaching as a viable tool to determine the inadequacies of pre-service teachers in demonstration of teaching skills as well as discovery of steps to eliminate such inadequacies. Pow and Lai (2021) have shown that microteaching often suffer from implementation imperfections due to some fundamental issues which is causing lack of interest and enthusiasm by the pre-service teachers. In spite of laudable records of microteaching, there are areas to be given attention in order to maximize the potency of the process.

Enhanced-microteaching is a training strategy for pre-service teachers to acquire teaching skills and pedagogical knowledge through an effective feedback by the tool of reflective practice. It was demonstrated in a study conducted by Al-Humaidi and Abu-Ramah (2015) who found out that the reflective model applied on a set of pre-service teachers in a microteaching course maximizes the microteaching procedure of the sample in the department of Curriculum and Instruction, Sultan Qaboos University, Muscat, Oman. In another study, Thabane (2019) discovered that microteaching process was made interesting by reduced feelings of professional isolation and development of confidence to teach when the tool of reflective practice was employed in a professional sharing among a lesson study group as an initiative to enhance microteaching among pre-service teachers in the department of Educational and professional studies, Central University of Technology, Free State, South Africa. Pow and Lai (2021) found out that pre-service teachers demonstrated a better understanding of concepts and theories of teaching using a constructed virtual learning environment for effective feedback in a microteaching among a set of pre-service teachers in Hong Kong Baptist University.

Microteaching at any level of training, and with whatever style is now classical with the advent of technology which now suggests blended strategy to improve its capacity for professional training. Therefore, in order to address this gap, this study was conducted not only to describe the teaching skills of pre-service teachers and ways by which microteaching can be improved for professional practice. More importantly, the findings will inform practitioners and policy makers on the basis for enhanced microteaching among professionals particularly, pre-service teachers in teacher training institutions in Nigeria and beyond.

Framework
This study takes its root from Experiential Learning Theory ELT by Kolb (2014) where experience is paramount to learning process. The theory is a cyclical model of learning in a four 4 stages of actions, namely: concrete experience which means ("doing"), reflective observation ("observing"), abstract conceptualization ("thinking"), and active experimentation ("planning"). Teacher education program equips pre-service teachers with actual teaching experiences, of which they can consciously reflect through the three 3 streams of reflective practice (Farrel, 2007). It follows with an attempt to conceptualize a personal theory through critical thinking on their own observations, and a planning process to apply the newly created theory or theories in the future. Teacher education program is indeed a

platform to equip pre-service teachers with pedagogical knowledge and teaching skills to be efficient in practice. In other words, they are expected to have mastered certain teaching skills through their training in microteaching sessions, and other training exposures. Some of these skills are manifested early during training, while others take time to develop and that informed the basis for teach-re-teach sessions in microteaching with the combination of Blended Reflective Practice. Therefore, the study categorized teaching skills to be demonstrated as: (1) Preparation Skills, (2) Introduction Skills, (3) Presentation Skills, (4) Evaluation Skills.

Research Question

RQ. What is the mean difference of pre-service science teachers' teaching skills before and after the microteaching sessions?

METHODOLOGY

An embedded experimental model of mixed method research with {QUANqual} notation by Creswell and Plano Clarke (2006) was adopted to collect data on teaching skills.

Embedded Design: Embedded Experimental Model
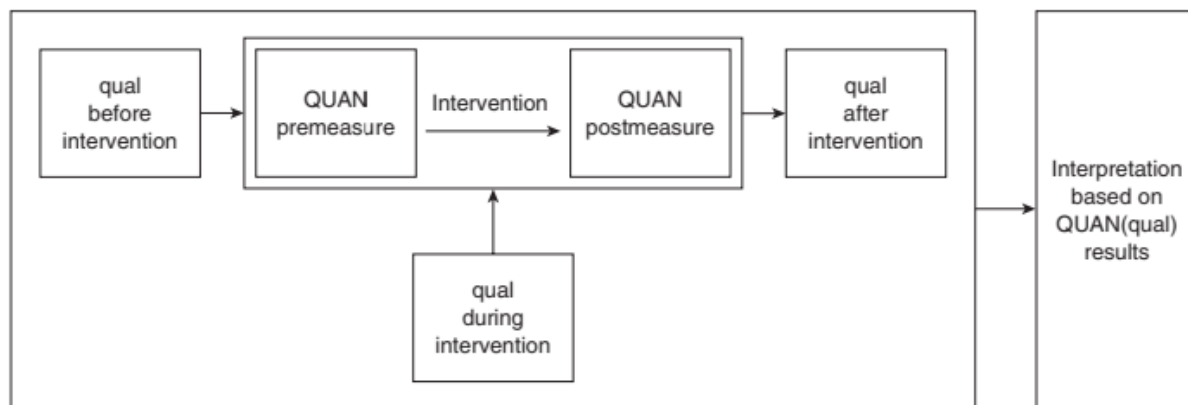
An intact class of 37 pre-service teachers in part 2 {2020/2021 session} integrated science combinations in the school of science, College of Education, Ikere-Ekiti, Nigeria participated in the study. Blended Reflective Practice was used to train the pre-service teachers as an intervention to enhance teaching skills in microteaching sessions. Data were collected quantitatively in one group pretest-posttest quasi-experimental design using Teaching Skill Rating Scale TSRS and qualitatively in interview sessions with pre-service teachers to support results from the intervention. Teaching Skill Rating Scale TSRS comprises of four (4) categories of teaching skills with twenty (20) teaching actions that pre-service teachers had to carry out in microteaching sessions. It also incorporates the application of basic science and technology skills, and for specificity the actions observed the following four (4) skills:

1. Preparation Skill
2. Introduction Skill
3. Presentation Skill
4. Evaluation Skill

Test reliability was determined by using the Cronbach Alpha coefficient which yielded a 0.85 value. The study lasted for five weeks. Blended Reflective Practice of face-to-face and face-to-screen reflective discussion was integrated into traditional microteaching sessions to complement microteaching feedback among the microteaching groups in order to improve teaching skills. These activities focused on four 4 categories of teaching skills: (1) Preparation Skill (2) Introduction Skill (3) Presentation Skill (4) Evaluation Skill. The researchers created a WhatsApp group tagged as face-to-screen mode of discussion to complement face-to-face feedback on teaching skills. The focus of the Blended approach is to enhance microteaching in order to improve the pre-service teachers teaching skills. At the end of the first microteaching session, the supervisor initiated reflective discussion in face-to-face and in face-to-screen where pre-service teachers were involved in group discussions to review their actions before the re-teach session. Accordingly, the pre-service teachers were guided by the supervisor both within and outside the discussion in order to master teaching skills of preparation, introduction, presentations, and evaluation. Pre-service teachers particularly were also able to engage in online discussions and comments through the WhatsApp group. Blended Reflective Practice during microteaching sessions created an opportunity for synchronous and asynchronous discussions with its attractive and interactive mode of constructive feedback among pre-service teachers. T-Test statistics was computed to compare the mean difference between pre and posttests results.

FINDINGS AND DISCUSSIONS

The result of T-Test statistics of mean difference of pre-service science teachers' teaching skills before and after the microteaching sessions.

Table 1. Mean scores of pre-service science teachers' teaching skills before and after microteaching sessions

Teaching Skills	Pre/Post	N	$\bar{X}$	SD	DF	T	Sig (2-tailed)
Preparation	Pre-test	37	1.08	1.43	36	25.20	.000*
	Posttest	37	10.02	2.66			
Introduction	Pre-test	37	2.75	1.51	36	8.11	.000*
	Posttest	37	6.32	0.74			
Presentation	Pre-test	37	0.84	0.71	36	31.30	.000*
	Posttest	37	8.10	2.31			
Evaluation	Pre-test	37	2.77	1.13	36	22.43	.000*
	Posttest	37	5.93	2.11			
Total Scores	Pre-test	37	7.44	4,78	36	34.44	.000*
	Posttest	37	30.37	7.82			

* p< 0.05

Table 1 indicates that there were differences between the pre-test and post-test scores of pre-service teachers on the overall teaching skills (t= 34.44, p<0.05). Similarly, the t-test values for each of the four 4 categories of teaching skills were significant: For Preparation Skills (t= 25.20, p<0.50); For Introduction Skills (t= 8.11, p<0.50); For Presentation Skills (t= 31.30, p<0.50); For Evaluation Skills (t= 22.43, p<0.50). Consequently, it was concluded that

Blended Reflective Practice is effective when combined with microteaching to enhance pre-service teachers teaching skills in teacher education programme This improvement in pre-service teachers' teaching skills following the intervention could be attributed to various reasons. Most importantly, blended activities might have provided pre-service teachers with experiences that alleviate their performances. Pre-service teachers had the opportunity to interact in a guided and unguided times outside the group discussion of teaching skills within the microteaching sessions. Moreover, they received constructive feedback from their supervisor and peers about their performances during the microteaching sessions. Face–to-face reflective group discussions allowed guided and constructive interaction among the pre-service teachers while face-to-screen gives room for synchronous and asynchronous participation which gives an opportunity to work on the pre-service teachers' emotions. It disallowed grievances which are more often unavoidable in the usual microteaching feedback on demonstration of teaching skills. The current findings are in line with Mupa and Chinooneka (2015) who showed that effective teaching usually takes place where there is reflective practice.

It also validates Al-Humaidi and Abu-Ramah (2015) who used reflective model to encourage pre-service teachers' participation in microteaching tasks and activities in Sultan Quaboo University, Oman. The findings are consistent with the submission of Pow and Lai (2021) that microteaching is more productive in training the pre-service teachers when combined with reflective practice. The researchers conducted interview sessions before, during, and after the microteaching sessions. The responses from the pre-service teachers supported the previous conclusion. The following are some selections of pre-service teachers' views about Blended Reflective Practice: - "Discussion through WhatsApp gives me the opportunity to express my mind in a relaxed mood." - "I could scroll through the discussions as convenient, and even severally until I am satisfied." - "My peers were pleased and free to share their views on topics of interest." - "I enjoyed microteaching and how I wish it should continue." The statement perhaps was borne from the basis that online discussion possesses communicative and inclusive values for constructive feedback and confidence in classroom practices.

CONCLUSION

Based on the findings of this study, it was concluded that combination of Blended Reflective Practice and microteaching are effective in improving pre-service teachers' teaching skills. Reflective discussion of teaching skills both in face-to-face, and in face-to-screen offers pre-service teachers the opportunity to receive feedback constructively and to exchange views in a relaxed mood. Therefore, blended Reflective Practice should be incorporated into pre-service teacher preparation programs. The opportunity to interact across synchronous and asynchronous interfaces help pre-service teachers to overcome emotional challenges and other anxieties of the digital era. However, the above conclusion is subject to review based on sample size, time of intervention and other related variables which might limits its generalization. Nevertheless, other areas can still be investigated such as; the impact of various social media and applications on improvement of teaching skills. Also, educators and pre-service teachers' perceptions of Blended Reflective practice should be explored, while qualitative research can be conducted to probe further the potential of blended Reflective Practice in various fields.

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