EFFECT OF MICRO-TEACHING MODES AND LEARNING STYLES ON PRE-SERVICE TEACHERS' PRACTICAL TEACHING PERFORMANCE

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Abstract

The purpose of this study was to investigate the micro-teaching modes and learning styles on pre-service teachers' practical teaching performanc. The study adopted pretest-posttest, control group, quasi-experimental design with 4x3 factorial matrix. One hundred and thirty-five (135) pre-service teachers from three colleges of education in South-West, Nigeria who enrolled in a micro-teaching practicum course during 2011/2012 academic session participated and were randomly assigned into four conditions (three experimental and one control). Demographically, the participant pool was predominantly caucasian, consisting of 53 males and 82 females ranging in age from 18 – 23 years old. In this study, three null hypotheses were tested at 0.05 level of significance. Practical Teaching Skills Rating Scale (P.T.S.R.S.) and Learning Styles Self-Assessment Inventory (L.S.S.I.) instruments were utilized to collect data. The validity of the instruments were assessed and found to be adequate based on the assessment of two experts. Spearman Rank Order Correlation and Pearson Product Moment Correlation coefficients used to determine the reliabilities of the two instruments revealed .94 and .72 values respectively. Data were analysed using Analysis of Covariance, while Sidak post hoc analysis was used to explain the significant difference. Results of the study indicated that there was significant main effect of micro-teaching modes on pre-services teachers' practical teaching performance in micro-teaching. There were no significant main and interaction effects of micro-teaching modes and learning styles on students' practical teaching performance. Based on the findings, it was recommended among other things that teacher-educators are encouraged to use the combination of modes, since all the micro-teaching modes proved to be effective in the posttest performance.

Keywords: Micro-teaching modes, pre-service teachers, practical teaching skills, learning styles

Introduction

In teacher training, micro-teaching is especially important in the application of theory to practice (Kuran, 2009). Micro-teaching method was first implemented at Standford University, USA by Dwight Allen and colleagues in a way to train better pre-service teachers (Huba & Freed, 2002). It was one of the innovations created in the 1960's and 1970's by American educators who were encouraged to propose and implement a variety of innovations. The use of micro-teaching spread rapidly in the United States, Europe and some other developing countries (Klinzing & Floden, 2003). Its theoretical structure was formulated and evaluated at a later stage. This technique has been adopted in teacher training institutions as well as public and private organizations for in-service training (Benton-Kupper, 2001; Butler, 2001; Amobi, 2005; Harrison, 2005; Lee & Wu, 2006; Bell, 2007; Guney & Ersoy, 2010).

In Nigeria, the origin of micro-teaching could be traced to the Alvan Ikoku College of Education, Owerri. It was introduced and incorporated into the college programme aimed at serving as

clinical preparation of the pre-service teachers. The effort of the college was not unconnected with the grant from the UNESCO (Salawu & Afolabi, 2002). Micro-teaching is a method that aims to teach pre-defined critical teacher behavior of pre-service teachers (Gorgen, 2003). Through theory and practice, pre-service teachers are provided with the knowledge and skills necessary for them to acquire the three basics components of teacher education, namely, cognitive, psychomotor and affective domains. There are several approaches through which pre-service teachers are provided with practical experience during the course of their training. In this regard, micro-teaching seems to have great potential because it can provide pre-service teachers with opportunities to try their theoretical information in practical settings, so their confidence in their ability to teach can increase. According to Goodings (as cited in Adedapo, 2013) by exposing teachers in training to the realities of their future carriers in a controlled situation, enable them to eliminate a variety of weakness characterized by beginning teachers. Not only are they better prepared to teach but they also required a high level of confidence in their own abilities.

The question of what skills pre-service teachers should acquire in their professional development and how these skills should be taught had always engaged attention of teachers' educators. This led to the design of micro-teaching as a technique for such a task by Dwight Allen with a team of teachers and researchers at Standford University, California in the 1960s (Maheshwari, 2011). Ijiga (2010) stressed that based on theories of human learning, and the nature of teaching, some skills have been put forward as being capable of facilitating a more efficient teaching and pupils' learning. Some of such skills include questioning, communication and stimulus variation. These skills are initiated to enhance pre-service and practicing teachers' performance in teaching and learning activities.

An important phase of teachers' preparation programme is the observation of the teaching-learning process, which is designed to bridge the gap between theory and practice by enabling the trainee to take into account that which constitutes effective teaching (Morris, 2007). He further stressed that implicit in observation is the recognition of those strategies and behaviours which significantly affect students' learning in the classroom. Traditional direct observation in the classroom suffers a lack of commonality in experience because of the dispersion of observers into a wide variety of situations. Furthermore, its temporary nature precludes accurate detailed recall for discussion in seminars. Such limitation can be overcome through the use of micro-teaching modes. Any effort in improving micro-teaching is therefore directed on perceptual, symbolic and audio modes. These three modes therefore constitute the focus of this study. A perceptual mode is a teaching episode, presented by a master teacher personally through a videotape, which exemplifies in an exaggerated manner the intended teaching behaviour. A symbolic mode is a detailed written description of the specific teaching behavior to be acquired by the pre-service teachers and it also includes examples of such behavior and rationale for its use. Audio mode implies the use of audio electronic medium in a way to facilitate teaching skills.

Evidence from research suggests that some skills are easily acquired through perceptual, symbolic/visual or audio modes. Salawu (1999), for instance, found no significant difference between perceptual and direct modes in developing probing questioning skill. Myrick (1969) studied the effectiveness of the various types and combination of modes of teaching skills and found that in counseling, audio mode was more effective than video, in eliciting statements of self reference. Konczak and Dossett (2006) examined the effectiveness of different presentation formats: audio only, text only, audio plus text, and video for active learners in a supervisory skills training programme. The study found no significant difference among the four mode

presentation formats in terms of learning recall. Yusuf (2006) investigated the comparative influence of video and audiotapes feedback modes on the performance of pre-service teachers in micro lesson. Forty pre-service teachers were assigned to two groups: videotape group (20), and audiotape group (20) and they were rated on their use of communication and questioning skills, after the written and oral critique of their recorded pre-treatment micro lesson. The study revealed no significant difference in the performance of the two groups.

While there is some evidence for modality specific strengths and weaknesses (Rourke, Ahmad, Collins, Hayman-Abello, Hayman-Abello, & Warriner 2002), what has not been established is matching the instructional style to individual learning strength in microteaching. For example, (Constantinidou & Baker, 2002), found that visual presentation through the use of pictures was advantageous for all adults, irrespective of a high or low learning-style preference for visual images. Indeed, it was especially advantageous for those with a strong preference for verbal processing.

Although the consideration of learning styles and student outcomes has a long history in educational psychology (Dunn, Beaudry, & Klavas, 1989), the publication of Gardner's (1983) theory of multiple intelligences (MI) inspired a renewed interest and concern about how individual differences in cognitive processing affect the learning process. Thus, pedagogical implications have been observed in Kolb's work, which divides learning into seven different styles (Loo, 2004), as well as the writing of Lazear (1991) who directly applies MI theory to the learning process. Students, for example, can be categorized as preferring material that is presented either in visual, auditory, kinesthetic, or spatial modalities. Gee (1990), Dille and Mezack (1991), Gibson and Graff (1992), Richardson (1994), Riding and Grimley (1999), Cassidy and Eachus (2000), and Zhang (2002) demonstrated that the style of learning and thinking do affect the academic performance of the learners. Grigorenko and Sternberg (1997), and Garcia and Hughes (2000) found significant correlations between academic achievement and thinking styles. Contrary to this, the results of studies conducted by Nelson (1986), Coggins (1988), Billing and Cobbs (1992), Kaur (1999), Ruksasuk (2000), Dentino (2001), and DeTure (2004) led to the inference that learning styles are poor predictors of success.

Literature was reviewed on the various strategies of teaching micro-teaching as experimented by various researchers with an intention to stem the yearly poor performance of student teachers during teaching practice exercise conducted by teacher education institutions. It is clear that: (i) there is no link between perceptual, symbolic and audio modes of instructional strategies and practical teaching performance. (ii) in Nigeria, little or no research efforts have been made in the area of learning style preferences and students' practical teaching achievement. This present study is concerned with some of these issues particularly the effect of use of perceptual, symbolic and audio presentation modes on pre-service teachers' acquisition of teaching skills of questioning, communication and stimulus variation. Basically, the study investigated the effect of micro-teaching modes (perceptual, symbolic and audio) and learning styles on pre-service teachers' practical teaching performance in micro-teaching setting.

Statement of the Problem

Also, there is abundance of studies that focused on the effect of students' learning style preferences on learning outcomes in traditional classroom settings. Several studies have found that academic achievement is positively affected when teaching correlates with students'

preferred learning style in the traditional setting (Miller, Always & McKinley 2003). Therefore, the question is how students' learning preferences affect their learning outcome in a micro-teaching setting.

This study, therefore, investigated the effect of micro-teaching modes (perceptual, symbolic, audio) and the conventional method on pre-service teachers' acquisition of practical teaching in micro-teaching settings. It also investigated the interaction effect of pre-service teachers' learning styles in selected teaching skills.

Objectives of the Study

The objectives of this study are to investigate whether there will be any significant main effect of the micro-teaching modes and learning styles on pre-service teachers' practical teaching performance in micro-teaching.

Hypotheses

In view of the identified problem, this study generated and tested the following null hypotheses at 0.05 alpha level:

(i) There is no significant main effect of micro-teaching modes on pre-service teachers' practical teaching performance in micro-teaching.

(ii) There is no significant main effect of learning styles on pre-service teachers' practical teaching performance in micro-teaching.

(iii) There is no significant interaction effect of micro-teaching modes and learning styles on pre-service teachers' practical teaching performance in micro-teaching.

Methodology

The study adopted a pre-test – post-test, control group, quasi-experimental design, using a 4x3 factorial matrix. Four instructional modes (perceptual, symbolic, audio and conventional method) and one moderating variable (learning styles) were investigated for effectiveness in the experiment while the learning outcome of pre-service teachers with respect to practical teaching skills was the dependent variable.

All the NCE Year II students in three Colleges of Education in Oyo and Ogun states, Nigeria, formed the population of the study. The three colleges that satisfied inclusive criteria of availability of micro-teaching projection room, adequacy of Educational Technology lecturers and teaching of "Micro-teaching Theory" as one of the courses at the first semester were purposively selected to participate in the study. For the sample, each campus of Emmanuel Alayande College of Education, Oyo (EACOE) and Federal College of Education (Special), Oyo (SPED) was assigned to a micro-teaching mode using simple random sampling, while FCE, Abeokuta a distance of one hundred and ten kilometers to Oyo, location of the experimental groups was the control group, to reduce interaction that could possibly occur among the groups. In each campus of EACOE and SPED an intact class of a teaching subject was randomly sampled. In all, a total of 135 students (53 males and 82 females) were involved. The average age of the students was 19 years.

Two measuring instruments, Practical Teaching Skills Rating Scale (PTSRS) and Learning Styles Self-Assessment Inventory (LSSI) (for classification into groups), and four procedural

instruments - The instructional modules on perceptual mode (audio-visual material), symbolic mode (printed material), on audio mode (audio material) and the Operational Guide for Conventional-method of Instruction (OGCMI) were used for the study.

The PTSRS is an adapted format of Micro-teaching Practicum Assessment (MPA) of Emmanuel Alayande College of Education, Oyo. This instrument was designed to assess pre-service teachers' performance in a practical skill demonstration. Twenty-four items representing eight specific skills that concerned questioning, communication and stimulus variation skills from the original instrument of forty items were selected for this study. The behaviour in each of these sections in form of performance criteria were observed and graded accordingly by awarding scores on a five-point rating (1 – Poor, 2 – Average, 3 – Good, 4 – Very Good and 5 – Excellent). The total obtainable mark for each skill is 40, totaling 120. The PTSRS instrument was re-validated and trial-tested for reliability. The content and face validity of the instrument were carried out through the comments of the experts who examined the items to determine their suitability for the group. The calculated cumulative Spearman Rank Order Correlation value was .94. However, the calculated values for each of the three skills are: .90 for questioning, .88 for communication and .84 for stimulus variation, all which were considered reliable.

The Learning Styles Self-Inventory instrument was originally developed by Gardner (1993) to classify learners into different learning style preferences. It was adapted and re-validated by Farkas (2003), and a reliability co-efficient of 0.73 was established using Pearson Product Moment Correlation Coefficient. It was Farkas' version of the instrument which was adapted and re-validated by the researcher. The instrument consists of twenty-one items and only the items that were considered relevant to this study were retained; and in each item, the respondent was requested to rank-order four words by assigning *not like me, a little like me, like me and a lot like me* for 1, 2, 3, and 4 respectively; in a way that best describes his or her learning style. The sum of scores represented students preferred learning styles. Thus, grouping of students into visual, auditory and reading/writing learning styles were based on these scores, that is, where each has his/her highest number of score. The content validity of the instrument was re-established to ascertain its cultural adaptability for use in Nigeria. In order to ascertain the reliability of the instrument, test-retest method was used and the inventory was administered on a set of 200 level students of a school separate from those sampled. This was done before the experiment. Pearson Product Moment Correlation coefficient from the two tests yielded reliability coefficient of 0.72.

The study adopted the intact class method and all the four groups were randomly assigned a micro-teaching mode each. The research assistants were trained on the topics to be treated and how to use the PTSRS. The pretest took place immediately after assignment to research groups. After the pretest, the next four weeks were used for treatment for the groups. The posttest lasted for two weeks. The data collected were analysed using descriptive statistical tools which include mean and standard deviation to show appropriate estimates of the scores for each group and sub-group. The inferential statistical tool of Analysis of Covariance (ANCOVA) was also employed, while Sidak post hoc analysis was used to explain the significant difference.

Results

Ho_1: There is no significant main effect of micro-teaching modes on pre-service teachers' practical teaching performance in micro-teaching.

Table 1: Summary of analysis of covariance of students' practical teaching performance according to treatment and learning style preferences

Source of Variation	Sum of Squares	df	Mean Square	F	Sig. of F
Covariates (Pretest)	872.920	1	872.920	52.603	.000
Intercept	1449.982	1	1449.982	87.377	.000
Treatment Group	419.519	3	139.840	8.427	.000*
Learning Style	10.100	2	5.050	.304	.738
2 Way Interaction					
Treatment X L. Style	114.516	6	19.086	1.150	.338
Explained	1774.000	12	147.833	8.909	.000
Residual	2024.526	122	16.594		
Total	3798.526	134			

** Denote Significant F at p<0.05 R squared = .467 (Adjusted R^2 = .415)*

Table 1 revealed the result of the main and interaction effects of treatment and learning style on students' practical teaching performance in micro-teaching. The table revealed significant main effect of micro-teaching modes on the students practical teaching performance ($F_{(3,122)}$ = 8.427, p<0.05). This implied that the post practical mean performance scores of the students exposed to the different micro-teaching modes are significantly different. Therefore, the null hypothesis one is rejected.

In order to determine the magnitude of the post practical mean performance scores of the students exposed to the different micro-teaching modes, the result of the Multiple Classification Analysis (MCA) presented in Table 2 was used.

Table 2: Multiple classification analysis of students' practical teaching performance scores according to treatment and learning styles

S/N	Grand Mean = 85.669 Variable + Category Instructional Strategy	N	Unadjusted Deviation	Eta	Adjusted for Independent + Covariates	Beta
1	Perceptual	33	0.372		3.301	
2	Audio	30	-0.333		2.794	
3	Symbolic	33	-1.959		1.277	.68
4	Conventional	39	-4.064	.17	-1.390	
	Learning Style					
1	Aural	39	-1.047		1.677	
2	Visual	40	-1.254		1.331	
3	Reading & Writing	50	-1.439	.01	0.730	.05
	Multiple R Squared					.467
	Multiple R					.683

The result in Table 2 revealed that, with a grand mean of 85.669, the students exposed to the perceptual mode recorded the highest adjusted post practical teaching performance score of 88.970 (85.669 + 3.301). The students exposed to the audio mode had the next highest adjusted post test practical teaching performance score of 88.463. The students exposed to the

symbolic mode recorded the next highest post test practical mean score of 86.946 while the students exposed to the conventional method obtained the lowest mean practical score of 84.279. This outcome showed that the perceptual micro-teaching modes had the greatest potency at effecting students' practical teaching performance in micro-teaching. The result in Table 2 further revealed that while treatment (micro-teaching modes) alone accounted for 46.24% $(0.68)^2$ of the variance in the students' practical skill acquisition scores, the independent and moderator variables jointly accounted for 46.7% $(.683)^2$ of the variance observed in the dependent measures.

In order to trace the source of the significant difference recorded in table 1, the Sidak post-hoc analysis presented in Table 3 was carried out.

Table 3: Sidak post-hoc test of students' practical teaching performance on treatment groups

Treatment Groups	Mean	Perceptual	Audio	Symbolic	Conventional
Perceptual	87.505				*
Audio	86.899				*
Symbolic	85.328				
Conventional	82.942	*	*		

** Denote pairs of groups that are significantly different at p<.05*

The result in table 3 showed that the source of the observed significant difference in strategy reported in table 1 is due to the significant difference between the pairs of perceptual and conventional strategy as well as audio and conventional strategy. The difference between the mean practical teaching performance scores of the pairs of perceptual and audio; perceptual and symbolic; and symbolic and conventional modes are not statistically significant at the .05 level of confidence.

Ho_2: There is no significant main effect of learning styles on pre-service teachers' practical teaching performance in micro-teaching

The result in table 1 revealed no significant main effect of learning styles on the students' practical teaching performance in micro-teaching ($F(2,122) = 0.304$, $p>0.05$). This means that the post-test mean practical teaching performance scores of students preferring aural, reading/writing, and visual learning styles are not significantly different. Thus, the null hypothesis two cannot be rejected. However, the result of the MCA in table 2 revealed that in the order of performance, the students who preferred the aural learning style recorded the best adjusted post test mean practical teaching performance score of 87.346; which was closely followed by the student preferring the visual style of learning who recorded post-test mean score of 87.000 while the students who preferred the reading/writing learning style recorded the lowest post-test practical teaching score of 86.399. The result in table 2 further revealed that students' learning style alone accounted for just 0.25% $(0.05)^2$ (less than 1%) of the variance observed in the students' practical teaching performance in micro-teaching.

Ho_3: There is no significant interaction effect of micro-teaching modes and learning styles on pre-service teachers' practical teaching performance in micro-teaching

The result of the 2-way interaction effect in Table 1 revealed no significant interaction effect of micro-teaching modes and learning style on the students' practical teaching performance in micro-teaching ($F_{(6,122)}$ = 1.150, p>0.05). This result showed those students' practical teaching performance in micro-teaching, after exposure to different micro-teaching modes, do not vary significantly among aural, visual and reading/writing learning style learners. As a result, the null hypothesis three is retained. Hence, students with different learning styles do not differ significantly in their practical teaching performance in micro-teaching.

Discussion

The result of the first hypothesis revealed significant main effect of micro-teaching modes on the students' practical teaching performance. It also revealed the direction of significance, which shows that the mean achievement score of the students exposed to the perceptual mode was the highest followed by that of the students exposed to the audio strategy. The mean achievement score of the students exposed to the symbolic mode came next while the students exposed to the conventional mode recorded the lowest mean practical teaching performance score.

Findings showed that the perceptual instructional micro-teaching mode had the greatest potency of effecting students' practical teaching performance in micro-teaching. With this situation therefore, one would expect those who received instruction through perceptual mode to recall better the subject matter as presented by the teacher than any of those who just received the information through the other modes. The finding might not be unconnected with the enthusiasm which video use provided. The participants were helped to perceive critically what they watched on the screen with active participation of the students in the programme. The method used might also have provided the viewers the opportunity of having a mental model after the viewing session. The result of this study agreed with Jimoh's (2002) study on the effects of videotaped feedback. The results show that learners exposed to videotaped instruction performed significantly, better than their counterparts exposed to the conventional method of instruction. Also, this study corroborates the findings of Ayo-Obiremi (2008) that the students treated with video and question and answer feedback performed significantly better than their counterparts treated with the question and answer feedback only. Findings of the study also agreed with Salawu (1999) who carried out a study on the effects of three instructional modes on pre-service teachers' learning outcomes in selected teaching skills. He found out that a combination of direct mode and video-taped mode was superior in students' achievement in cognitive and practical teaching.

The second hypothesis was presented to investigate the effect of learning styles on pre-service teachers' practical teaching performance in micro-teaching. The result revealed in order of performance that the students who preferred the aural learning styles achieved highest adjusted post test mean practical teaching performance score which was closely followed by preference for visual style of learning, while the students who preferred the reading/writing learning style recorded the lowest post test practical teaching performance score. However, no significant effect was found.

With this finding, one it seems that there is the tendency for a mixture of preference in the modes of presentation of the instruction which must have incidentally influenced students' performance across the board. Also, the findings of the present study might not be unconnected

with the notion held in some quarters that learning styles are not really "styles" but rather "preferences" in that we do NOT learn best by using one style of learning. That is, we prefer one or more styles over others. Learning styles can vary in different situations; and learning styles research has produced mixed results as reported by Ayo-Obiremi (2008) in her study. The result of this study agreed with the discovery by Smith, Cavanaugh, Jones, Venn and Wilson (2006) that learning styles had no significant effect on student performance following instruction in clinical skills via interactive multimedia.

In this study, the third hypothesis which investigated the interaction effect of micro-teaching modes and learning styles on the pre-service teachers' practical teaching performance in micro-teaching was examined, the result of the 2-way interaction effect revealed no significant interaction effect of micro-teaching modes and learning styles on the pre-service teachers' practical teaching performance in micro-teaching. This finding suggested that matching students' learning style preferences with micro-teaching modes compatible with those preferences would not increase their practical teaching performance. This result confirmed that learning styles and micro-teaching modes do not interact in a way that could affect learning outcome.

One possible explanation of this situation is that since all the students irrespective of their learning style preferences were taught by the same lecturer under the same classroom environment using the same scheme of work, irrespective of the presentation modes, all of them could be inspired to perform at the best of their ability. The researcher was unable to locate a study that investigated interaction effect of micro-teaching modes and learning styles on the pre-service teachers' practical teaching performance. There are however other studies that investigated the impact of learning styles and micro-teaching modes using pre-service teachers in higher institutions of learning.

The finding of this study is consistent with the investigation conducted by Korhonen and McCall (2004). The authors investigated the effects of learning style and learning environment on achievement of students on a basic computer-programming course and concluded that there was no significant interaction effect of learning style and learning environment in post test mean score. The result of this study agreed with that of Noppe, Achterberg, Duquaine, Huebbe, & Williams (2007) where they reported an investigation that sought to assess whether the receipt of PowerPoint handouts was moderated by learning styles. They found that learning styles were not predictive of test performance as a function of receipt of handouts. On the contrary, the result is not in agreement with John's (2002) study who found significant interaction effect of the learning style and learning environment in post test mean score of participants. From these findings, one can conclude that the influence of learning styles on performance is inconclusive and may depend on some other factors. This calls for further investigation.

Conclusion and Recommendations

This study has investigated the potency of micro-teaching modes (perceptual, symbolic, audio and conventional method) and learning styles on pre-service teachers' practical teaching performance in micro-teaching setting. Micro-teaching modes hold qualities that can enhance practical teaching performance. Learning styles and the micro-teaching modes work equally harmoniously to enhance practical teaching performance in micro-teaching. Since all the micro-teaching modes showed improvement over the post-test, the best approach to selection of the

mode is not to despise any of them but for modern teacher-trainers to use the combination of modes in order to enhance a rewarding micro-teaching session.

Based on the findings of this study, the following recommendations are made:

(i) Teacher-educators are to be trained and encouraged to use perceptual mode of micro-teaching to reduce the difficulties encountered by the trainee-teachers during teaching practice.

(ii) Teacher-educators are encouraged to use the combination of modes, since all the micro-teaching modes proved to be effective in the post test achievement, in order to enhance a rewarding micro-teaching session.

(iii) The National Commission for Colleges of Education (N.C.C.E.) should ensure that micro-teaching laboratories are well equipped with close circuit television, digital video camera, plasma television sets, video disc of model teaching skills, detailed written transcripts of teaching skills, and detailed recorded audio packages of teaching skills in all teacher education institutions in Nigeria. This will allow teacher trainers an opportunity of carrying out micro-teaching practicum as it is done in developed countries.

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