

Effects of Participatory Learning Technique on Achievement and Attitude of B. Ed. Students in Educational Research Methods

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ABSTRACT This study investigated the effects of Participatory Learning Technique (PLT) on achievement and attitude of B.Ed. students of the Delta State University, Abraka, Nigeria, in Educational Research Methods. This was necessitated by the investigator's worry over the continued poor performance of these students in this course whom in addition seemed not to be bothered about such gross failures. A sizeable number of them failed to graduate at the stipulated time. Using a Randomized Control Group Pretest-Posttest design and a t-test for independent samples ($n = 30$), it was found that the PLT group scored significantly higher on both criterion variables. It was concluded that the PLT was effective in not only enhancing learning output of the students but also in developing positive and favourable attitude towards the subject. It was therefore recommended that lecturers in this subject area should as a matter of importance create active participation of students in classroom teaching to maximize outcomes.

INTRODUCTION

The investigator has observed over the years that many B. Ed. students in Delta State University, Abraka, Nigeria, have performed poorly in Educational Research Methods. Some of them have carried this course over two or three times and still failed to graduate at the stipulated time. This situation is worse for those students who are not mathematically or science-inclined. To most of them, Educational Research Methods becomes awesome and bizarre and they begin to loathe the course. This leads to further poor performance. B. Ed. students who would be full classroom teachers of tomorrow, could really be professionally literate if they are well-equipped with a grounded understanding and interest in Educational Research Methods while in training at the university. It would therefore amount to a great injustice to ignore the need to try other instructional strategies in ascertaining that they develop positive attitudes and thus gain better performance in this relevant subject in today's world of sophistication through research. The investigator therefore wondered whether there would be an improvement both in attitude and performance if the method of teaching the subject were changed. These necessitated this study.

Studies worldwide have found that a competent and effective teacher is that one who applies appropriate teaching strategies to ensure successful learning outcomes. Research findings

have revealed that adopting appropriate instructional methods especially in science\ mathematically oriented subjects yields better learning outcomes. Research recommendations have focused on the use of instructional methods that make the teaching\learning process more interesting, meaningful, purposeful, exciting, participatory, and thus effective and fruitful (Bello 2000; Duze 2005; Ibraheem 2004; Kaplan and Owings 2001; Nzewi and Ossisioma 1995; Olaniran 2004; Rai 1999). To this effect, several innovations in instructional methods have been identified and adopted.

If a teacher observes that one method is failing to achieve desired learning objectives, it may become necessary to try another. It is the teacher's expertise that determines what method suits his instruction best in maximizing positive learning attitudes and outcomes. Indeed, this is an ethical requirement in that a teacher has a professional responsibility to do what works best in his classroom to deliver the curriculum. These informed the use of Participatory Learning Technique (PLT) as against the normal traditional lecture method in a class of B.Ed. undergraduates, who already dread and loathe Educational Research Methods, to discover whether performance and attitude towards the subject would be significantly enhanced. The study would thus contribute to existent research examining ways of boosting quality in school learning of seemingly difficult or dreaded

subjects. This study therefore investigated the effects of Participatory Learning Technique (PLT), against the normally used Traditional Method (TM) on the achievement and attitude of B.Ed. students in Educational Research Methods in Delta State University, Abraka, Nigeria.

Participatory Learning Technique (PLT) is a form of classroom organization which utilizes heterogeneous dependent group of twenty to thirty students who actively participate in the learning tasks under the guidance of the subject teacher while TM refers to the generally used teacher-centered or lecture method in which students participate very minimally or not at all. In the PTL for instance, the teacher is required to present logically the correct statistical application to a research problem followed by the complete solution of the statistical problem step by step and carrying the students along as he does this. He then writes a similar or related problem on the chalkboard and invites any student to take the lead, another to solve the first step, another the second, and so on, until the students arrive at the correct solution and explanations by themselves. If any student is confused along the line, another is asked to help out, with the teacher only coming in when no other student can proceed any further. The teacher can thereafter ask only a single student to apply and solve an entire problem on the chalkboard while the others give support. In this way, all the students actively participate in the learning process under the guidance of the teacher in a congenial and cooperative classroom atmosphere. The PLT method was used by Rai in 1999 for undergraduates and by Duze in 2005 for postgraduate students, in Educational Statistics. Their studies revealed significant achievements in performance and attitude of students towards the course.

Statement of the Problem

The study aimed at investigating the effects of Participatory Learning Technique (PLT) on achievement and attitude of B. Ed. students in Educational Research Methods with the following objectives:

(a) To observe and compare the effectiveness of the Participatory Learning Technique (PLT) and the Traditional Method (TM) on the achievement scores of B. Ed. students in Educational Research Methods; and

(b) To observe and compare the effectiveness of the two teaching strategies, PLT and TM, in developing positive and favourable attitude by B. Ed. students towards Educational Research Methods.

The question is: Is there any significant difference in outcomes when these different methods are adopted in classroom teaching of these students?

Hypotheses

To guide the investigation, the two following null hypotheses were formulated and tested in this study at the 0.05 level of significance:

H_{01} : There is no significant difference between the mean achievement scores of B. Ed. students taught through the Participatory Learning Technique (PLT) and the Traditional Method (TM).

H_{02} : There is no significant difference between the mean attitude scores of B. Ed. students taught through the Participatory Learning Technique (PLT) and the Traditional Method (TM).

METHODOLOGY

The study design is experimental, applying the Randomized Control Group Pretest-Posttest design. Experimental and control groups were obtained by random assignment of the subjects to the groups. The independent variable was manipulated by treatment. The composition of both groups remained constant throughout the study. The combination of random assignment to groups and the presence of a pretest and a control group served to control all the internal and external invalidity. Besides the students were not aware that this arrangement was for the purpose of research. The two dependent variables were the achievement in Educational Research Methods and attitude towards the subject. Achievement referred to the scores of the B. Ed. students obtained in the criterion test constructed by the investigator for the study while attitude referred to the student's scores

from the attitude scale also constructed by the investigator to measure their attitude towards Educational Research Methods. This experimental design for this study is shown in table 1.

Table 1: Randomized control group pre-test-post-test design

<i>Groups</i>	<i>Assignment</i>	<i>N</i>	<i>Pre-test</i>	<i>Treatment</i>	<i>Post-test</i>
Experimental	Random	30	Achievement and Attitude Scores	PLT	Achievement and Attitude Scores
Control	Random	30	Achievement and Attitude Scores	TM	Achievement and Attitude Scores

Population and Sample

Sixty B. Ed. students of the Delta State University, Abraka, formed the sample of the study. They were randomly selected out of a class of 79 students offering Educational Research Methods by simple random sampling. They were then assigned to two groups of thirty each also by simple random sampling. One group was the Experimental group and the other the Control group.

Instrumentation

Scores on achievement and attitude were collected through two different tools constructed by the investigator and validated by other experts in the field to be adequate in measuring what it intended to measure.

Construction of the Criterion Test

A criterion test covering the topics in the Course Outline for Educational Research Methods was constructed. It was a two-hour test comprising 25 items of the structured question type designed to eliminate guesses which usually accompany the multiple-choice question type. The test was revised on the basis of expert opinion and pilot study. The internal consistency of 0.86 measured through a test-retest carried out on 30 non-subjects was found satisfactory.

Construction of the Attitude Scale

The first draft of a fifty-item attitude inventory to assess the attitude of students towards Educational Research Methods was constructed bearing in mind the topics to be covered in the course outline. Each item was rated on a 4-point scale of Strongly Agree (4 points), Agree (3 points), Disagree (2 points) and Strongly Disagree (1 point) for positively worded items, the reverse being the case for negatively worded items. This tool was tried out on 30 B. Ed. students not involved in the study. Item analysis was done to ascertain the discriminating power of each item.

The upper 27.5% and lower 27.5% of the 30 non-subjects were sorted. The 't' value for each item was obtained between the mean scores of respective items, and it was observed that 50% of them were significant at 0.05 level. These 25 items were therefore retained in the final draft, with the same scale of agreement. The minimum and maximum scores of a subject on this attitude inventory may be 25 and 100 respectively. The test-retest reliability coefficient of this tool tried out on 30 students other than the subjects of the study was found to be 0.84 and satisfactory.

Experimental Treatment and Data Collection

All the subjects were administered a pretest on both the achievement criterion test and the attitude scale. The different mean scores from each were obtained and recorded. After that, the experimental group was taught through the Participatory Learning Technique (PLT) and the control group through the Traditional Method (TM). After the administration of this treatment, both groups were administered again the achievement criterion test and the attitude scale as posttests. Their different mean scores in each were also computed recorded.

Analysis of Data

The data collected from the tools were subjected to the t-test for independent means for statistical analysis. Significance was established at $p < 0.05$ and $df = 58$ all through. Results were presented on tables 2 to 5.

The data presented in table 2 enabled the researcher to establish the pre-experimental status of subjects as regards their achievement scores for both the experimental and the control groups, while the data presented in table 3 determined the pre-experimental attitude of the subjects towards Educational Research Methods for the two groups. The results, shown in tables 1 and 2, revealed that there were no initial significant differences between the experimental group and the control group in achievement and attitude to Educational Research Methods respectively.

before treatment. Thus, no covariate analysis was required for the post-experimental achievement and attitude scores of subjects.

To test the first null hypothesis (H_{01}), which states that there is no significant difference between the mean achievement scores of B. Ed. students taught through the Participatory Learning Technique (PLT) and those taught through the Traditional Method (TM), the t-test for independent means was employed. This compared the observed post-test mean scores of the experimental and control groups after treatment. The result is presented in table 4.

The calculated t-value of 10.61 was numerically greater than the critical t-value of 1.96, therefore, H_{01} was rejected. This means that there is a significant difference between the mean achievement scores of students taught through the Participatory Learning Technique and those taught through the Traditional Method. Thus, B.Ed. students taught through the Participatory Learning Technique (PLT) performed significantly better in Educational Research Methods than their counterparts taught through the Traditional Method (TM).

Also, the second null hypothesis (H_{02}), which states that there is no significant difference between the mean attitude scores of B. Ed. students taught through the Participatory Learning Technique (PLT) and those taught through the Traditional Method (TM), was tested by subjecting their mean scores after treatment to the t-test statistic. The result, presented in table 5, showed a higher calculated t-value of 5.17 than

the critical t-value of 1.96, therefore H_{02} was rejected. This means that there is a significant difference between the attitudes of students taught through the PLT and those taught through the TM. Thus, B.Ed. students taught through the Participatory Learning Technique (PLT) exhibited a more positive and favourable attitude to Educational Research Methods than their counterparts taught through the Traditional Method (TM).

DISCUSSION

This study found out that learning outcomes and attitudes of students towards Educational Research Methods were different when different teaching strategies were adopted. Specifically, the findings revealed that:

1. the learning output of students is significantly higher in Participatory Learning Technique (PLT) than the normally used traditional or lecture method of teaching in the universities. Students taught Educational Research Methods through the PLT performed significantly better than their counterparts taught through the normal Traditional Method (TM). This was evidenced in the wide difference between the mean achievement post-test scores of students in the two groups as well as in the large gap between the two t values.
2. the Participatory Learning Technique developed a more positive and favourable attitude among the students. There was

Table 2: t-test on pre-test mean scores of achievement before treatment

Group	N	X	SD	df	t_{calc}	$t_{critical}$	Decision
Experimental	30	10.12	6.72	58	1.47	1.96	Not significant
Control	30	12.49	5.85				

Table 3: t-test on pre-test mean scores of attitude scale before treatment

Group	N	X	SD	df	t_{calc}	$t_{critical}$	Decision
Experimental	30	53.66	11.41	58	0.06	1.96	Not significant
Control	30	53.13	12.34				

Table 4: t-test on post-test mean scores on achievement after treatment

Group	N	X	SD	df	t_{calc}	$t_{critical}$	Decision
Experimental	30	39.08	5.67	58	10.61	1.96	Significant
Control	30	23.51	5.73				P < 0.05

Table 5: t-test on post-test mean scores on attitude scale after treatment

Group	N	X	SD	df	t_{calc}	$t_{critical}$	Decision
Experimental	30	74.51	15.49	58	5.17	1.96	Significant
Control	30	57.52	9.18				p < 0.05

elicited a more positive and favourable attitude towards Educational Research Methods by the students taught through the PLT than those taught through TM. This was also evidenced by the wide gaps between the separate mean scores and the two t values.

Besides, the results established that both groups (experimental and control) exhibited the same entry behaviour from their pre-test comparisons, which showed no initial significant differences in their achievement and attitude towards the Course. Therefore in all probability, the difference between experimental and control groups cannot be attributed to chance, and must presumably have resulted from experimental procedure. Thus the findings were both practically and statistically significant.

These findings agreed with those of Duze (2005) and Rai (1999) who experimented with university students using the PLT. They observed significant advantages of the PLT method over the normal lecture method in teaching educational statistics. The advantages of active participation of students in the classroom, as revealed in this study, tallied with the studies and observations of Bello (2000), Ibraheem (2004), Kaplan and Owings (2001), Nzewi and Ossisioma (1995), Olaniran (2004), who variously identified several innovative instructional methods such as problem solving and practical approach, team teaching, concept mapping which are largely participatory in outlook especially in science and mathematically oriented subjects, as being significantly effective in capturing the interests of secondary school students in classroom instruction and thus boosting their performance in examinations.

CONCLUSION

This study found that the Participatory Learning Technique (PLT) is indeed more effective than the normal Traditional Method (TM) in not only enhancing students' achievements in

Educational Research Methods but also in developing more positive and favourable attitude towards the Course.

RECOMMENDATIONS

We therefore recommend that subject teachers, especially in the sciences, should adopt the Participatory Learning Technique (PLT) as often as it is necessary, to tap its many advantages in maximizing students' educational outcomes. Students should on their own organize themselves into small learning groups and teach themselves in such active participation in problem solving.

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