Comparative Study on Effect of Classroom Assessment Techniques and Students' Academic Achievement in Educational Measurement and Evaluation in Federal College of Education, Okene, Kogi State

Ifenyinwa OBI
&
Fidelis Chinedu ONWUNYILI
Department of Educational Psychology,
Federal College of Education, Okene, Kogi State

Abstract
The purpose of this study was to investigate the comparative study on the effect of Classroom Assessment Techniques (CATs) and students' academic achievement in educational measurement and evaluation in Federal College of Education, Okene. The study adopted a quasi experimental design. Population of the study comprises of the third year undergraduate students of Federal College of Education, Okene, Kogi state in six departments, an affiliate of University of Ibadan, Nigeria, who took educational measurement and evaluation course. The sample size of 40 students was selected purposively in accordance with the objectives of the study and a multiple-choice test comprised of 20 items was developed to test participants' levels of knowledge before and after the experimentation. The internal consistency reliability of the validated test instrument by 3 different measurement experts of the affiliated university was estimated using the KR-20 Formula, with an index of 0.86. The pre-test and post-test scores of the students in both the experimental and control groups were analyzed using descriptive statistics and compared using both paired and independent samples t tests. Pre-test results suggested no significant difference between the learning levels of students in the experimental and control groups, while post-test scores revealed that students in the experimental group (One minute paper) had significantly higher scores than those in the control group (Muddiest point) as when compared. It was then recommended among others that One minute paper should be preferred in assessing the students' prior-knowledge, recall and understanding in difficult courses or subjects to the students like educational measurement and evaluation.

Keywords: Achievement, Assessment, Classroom, formative, techniques

Introduction

Teaching without learning is just talking but formal teaching is done in the classroom setting and its aims are effectively achieved through proper assessment. Assessment is the systematic collection, examination, and interpretation of qualitative and quantitative data about student learning and the use of that information to document and improve student learning. Assessment which is vital to the education process could be used to establish frequent interactive assessment of students' progress, identification and understanding of their learning needs and adjust teaching appropriately (Briggs & Keyek-Franssen, 2010). Effective assessment begins with clear goals, as it usually takes some hard thinking before teachers can articulate the specific skills and competencies they hope to teach through the course content–what is most important to teach and what students should really learn. These practices are formally achieved in a classroom setting and referred to as classroom assessment.

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Nartgun (2010) ascertained that classroom Assessment as an attempt to build on existing good practices and provides a way to integrate assessment systematically and seamlessly into the traditional classroom teaching and learning process. It is an approach designed for teachers to assess what students are learning and how well they are learning. However, Classroom Assessment is an educational innovation that unites effort to improve both teaching and learning. It also involves students in active mental processing of new information and makes them more aware of themselves as a learner. Briggs and Keyek-Franssen, (2010) made an emphasis on classroom Assessment as a formative rather than a summative approach to assessment. Its purpose is to improve the quality of student learning, not to provide evidence for evaluating or grading students. It provides faculty with feedback about their effectiveness as teachers, and it gives students a measure of their progress as learners, by providing faculty with information on what, how much, and how well students are learning. Such assessments are created, administered, and analyzed by teachers themselves (Huba & Freed, 2000). The typical question addressed at the classroom level is: Did my students learn what I intended for them to learn today?

Black and Wiliam (2003) described formative assessment as activities undertaken by tutors and or students which provide information to be used as feedback to modify the teaching and learning process in which they engaged. This shows that formative assessment deals with information to the teachers and the students in the feedback form. Formative assessment/test could thus be referred to as the different tasks or activities that a teacher embarked upon with a view to measure degree of achievement of the instructional goals in a learner, though feedback to the students is inclusive. The tasks here ranges teachers asking questions from students during instructions/class, giving them assignments, conducting assessments in the form of short tests, and projects, giving them work in portfolios and a host of other activities that is test related. The learners' performance is measure through standardized marking of the scripts or the assessment of the verbal interaction. This gives the feedback to the teacher as well as the student when he/she receives his/her script. Formative assessment systematically and comprehensively assesses day to day students' academic achievement in order to bring feedback to the teacher and learners. It is therefore, learners centered and not content centered (Nartgun, 2010).

Classroom-level assessment, as promoted by Cross and Angelo (1983) through the use of Classroom Assessment Techniques, is an approach that reveals to individual college teachers what, how much, and how well their students are learning in time to remedy gaps in knowledge or understanding. CATs are excellent examples of formative assessment strategies and are based on seven assumptions. These assumptions are summarized as follows by Angelo and Cross (1993):

1. The quality of student learning is directly, although not exclusively, related to the quality of teaching. Therefore, one of the most promising ways to improve learning is to improve teaching.
2. To improve their effectiveness, teachers need to first make their goals and objectives explicit and then get specific, comprehensible feedback on the extent to which they are achieving those goals and objectives.
3. To improve their learning, students need to receive appropriate and focused feed- back early and often; they also need to learn how to assess their own learning.

4.   The type of assessment most likely to improve teaching and learning is that conducted by faculty to answer questions they themselves have formulated in response to issues or problems in their own teaching.

5.   Systematic inquiry and intellectual challenge are powerful sources of motivation, growth, and renewal for college teachers, and Classroom Assessment can provide such challenge.

6.   Classroom Assessment does not require specialized training; it can be carried out by dedicated teachers in all disciplines.

7.   By collaborating with colleagues and actively involving students in Classroom Assessment efforts, faculty members and students enhance learning and personal satisfaction.

Moreover, these techniques may be used in any type of class. Some techniques are for use in small groups; some are designed to check students' immediate recall and understanding; analysis and synthesis; others are for application and critical thinking. Angelo and Cross (1993) asserted that the use of these techniques will help the learners become more aware of their own learning process. Students may be hesitant to ask questions during class. Classroom Assessments Techniques give students opportunities to provide anonymous feedback to their instructor about their learning. Students often discover, as the instructor reviews the feedback, that others in the class had similar questions (theirs was not a "dumb question" after all). Classroom assessment activities can themselves be positive learning activities for students; they not only influence students' cognitions, they can be developed both to promote (and not just measure) writing skills or critical thinking skills, and to increase students motivation to take themselves and their learning more seriously (Ashakiran and Deepthi 2013). In addition, students may become more involved in their learning when they find that others in the class learned some interesting things that they had not picked up from the class session. Through greater involvement, students are likely to become more self-directed learners, and may be more motivated to successfully complete the class.

However, Classroom Assessment Technique helps faculty to focus on students learning by determining what students have learned and what is unclear, instructors can focus the class more effectively to meet the learning needs of that group. This may mean reviewing some areas, or spending less time in other areas. Unlike student evaluation surveys (summative evaluation) which are typically given at the end of the semester, Classroom Assessment Technique provides an on-going formative evaluation. The instructor can find out what can be changed immediately to help students to learn.

Angelo and Cross (1993) suggest that new users of Classroom Assessment Techniques will be most successful if: they use only those techniques that appeal to their intuition and professional judgment; they start with techniques that are quick and easy to use in a classroom setting in which the faculty member and the students are comfortable with; they only use CATs that they have previously tried on themselves; they allow more time to complete the task the first time than might seem necessary; and they "close the loop" by reporting back to students what they, as faculty, have learned from student feedback and how that information can be used to improve student learning.

These techniques are not new, effective teachers have been using various methods for years to find out what students are learning or not learning. When these means of learning are attached with technicalities and systematic approach towards achieving the educational set-objectives, it is referred to as Classroom Assessment Techniques. That is why Angelo and Cross (1993) defined it as an assessment that is generally simple, non-graded, anonymous, in-class activities designed to give you and your students useful feedback on the teaching-learning process. Whereas, Steadman (1998) added that it is a

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systematic approach to formative evaluation of student learning and tools for academic success. Studies on the use of Classroom Assessment Techniques during the learning and teaching processes revealed that learners largely achieved the desired learning goals of the course (Mansson 2013); learners appreciated the techniques for their comfort of learning (Ashakiran and Deepthi 2013); learners' working habits changed positively (Soataert 1998), communication and cooperation between learners and teachers improved; learners' interest in lectures, learning motivation, classroom control, and learners' satisfaction increased (Goldstein 2007; Tuby 2003; Cottell and Harwood 1998; Steadman and Svinicki 1998; Steadman 1998; Piopiunik, Schwerdt and Woessman 2020), and learners' critical thinking skills improved (Angelo and Cross 1993). Additionally, Classroom Assessment Techniques helped learners learn how to learn (Cottell and Harwood 1998).

An analysis of the literature on Classroom Assessment Techniques reveals that these techniques have been used in different disciplines and courses with positive results on learners' learning, including medicine (Ashakiran and Deepthi 2013), intercultural communication (Mansson 2013), research techniques courses (Nartgun 2010), engineering (Agrawal and Khan 2008), culture and civilization (Hoegl 1999), accounting (Cottell and Harwood 1998).

Measurement and evaluation is a field of study that concerns with the systematic quantitative description of attributes of certain persons, objects or events as well as attachment of valued judgement to this persons, objects or events. It can also be seen as an assignment of numerals to persons, objects or events. It is a crucial process behind how teachers test and assess educational concepts and problems and how it concerns the students' understanding in order to improve and promote learning. It starts with initial assessment before teaching exercise to formative assessment while teaching and then evaluation to know the extent at which set-objectives has been achieved. Therefore, it assesses the students' skills in prior-knowledge, as well as recall and understanding. Out of the 50 CATs by Angelo and Cross, One minute paper and Muddiest point (assessing prior-knowledge, recall and understanding) will be compared in this study as regards to students' achievement in educational measurement and evaluation.

One Minute paper is one of the commonly used CATs to assess prior-knowledge, recall and understand any educational concept. It provides a quick and extremely simple way to collect written feedback on student learning. Minute paper is a useful technique because it is anonymous and encourages the students to ask questions. This technique can be used after a class or at the beginning of a class to review the previous session. It is equally known as half-sheet response which provides a quick and extremely simple way to collect written feedback on students learning. To make use of the one minute paper, an instructor stops class two or three times minutes early and asks students to respond briefly to some variation on the following two questions: "what was the most important thing you learned during this class? And what important questions remains unanswered?" the students then expected to respond on index card or half-sheet of scrape-paper and hand over to their instructor (Angelo and Cross, 1993). Accoding to Ashakiran and Deepthi (2013), for proper effective achievement of a learning objectives, the teacher, decides first on what he/she wants to focus on and, as a consequence, when to administer the Minute paper (example: on students' understanding of a lecture, the last few minutes may be the best time or on a prior homework assignment, the first few minutes may be more appropriate) secondly, using the two basic questions from the "Description" above as starting points, write minute paper prompts that fit his/ her course and students. Try out his/her minute Paper on a

colleague or teaching assistant before using it in class; thirdly, plan to set aside five to ten minutes of his/her next class to use the technique, as well as time later to discuss the result; fourthly, before class, write one or, at the most, two Minute Paper questions on the chalkboard or prepare an overhead transparency; then, at a convenient time, hand out index cards or half-sheet of scrap paper to students; unless there is a very good reason to know who wrote what, direct students to leave their names off the papers or card; finally allows the students to know how much time they will have (two to five minute per question is usually enough), what kinds of answer he/she wants (words, phrases, or short sentences), and when they can expected feedback.

Moreover, another assessment technique that assesses the students' prior-knowledge, recall and understanding that has been used more often or by more college teachers is known as Muddiest point.The Muddiest Point is just about the simplest techn ique one can use. It is also remarkable efficient, since it provides a high information retu rn for a very low investment of time and energy. This technique provides speedy feedback on what students find least clear or most confusing. Presumably, this information helps faculty decide what to emphasize (more) and how much time to spend on topics. Students must also quickly assess what they do not understand and must be able to articulate their confusion (which is itself a complex and useful skill).

The technique consists of asking students to jot down a quick response to one question: "What was the muddiest point" The focus of the Muddiest Point assessment might be a Lecture, a discussion, a homework, an assignment, a play, or a film. It follows the following systematic approaches:

1. Determine what you want feedback on: the entire class session or one self- conta ined segment? A lecture, a discussion, a presentation?
2. If you are using the technique in class, reserve a few minutes at the end of the cl ass session. Leave
   enough time to ask the question, to allow students to respond, and to collect their responses by the usual ending time.
3. Let students know beforehand how much time they will have to respond and wh at use you will
   make of their responses.
4. Pass out slips of paper or index cards for students to write on.
5. Collect the responses as or before students leave. Stationing yourself at the door and collecting
   "muddy points" as students file out is one way; Leaving a "muddy point" collecti on box by the exit
   is another.
6. Respond to the students' feedback during the next class meeting or as soon as possible afterward.

Considering the influences and positive effects of classroom assessment techniques on teaching and learning process in formative approach and the different required skills in teaching and learning, what then are the best techniques (CAT) for proper assessment practices in learning educational measurement and evaluation?

Statement of the Problem

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Nigeria system of education has focused more on grading and poor implementation of formative assessments in higher institutions. For example, the aim of the implementation of Continuous Assessment Score (CAS) in Nigeria has failed as classroom teachers/lecturers/facilitators do positively influence the students' score by adding up the students' grade. Again, there has been lack of retention ability in knowledge acquisition among undergraduate students of federal college of educacation, okene in learning of educational measurement and evaluation. Educational measurement and evaluation is a vital and an inevitable course to every student teacher and therefore, teaching and learning of this course in Federal College of Education (FCE), Okene, Kogi State of Nigeria has been "content-interest" instead of "learners-interest". It has also been discovered that a lot of students fail, not because they did not participated in the classroom assessment practices, rather, they were unable or could not understand or internalize what was thought. This therefore, could not help the instructors in assessing where the students are having difficulties as well as proffering better teaching method in order to assist formative assessment and promote learning.

Purpose of the Study
The purpose of this study is to investigate on the comparative study of the effect of Classroom Assessment Techniques on student academic achievement in educational measurement and evaluation. Specifically, the study sought to:

1. Determine the effect of One minute paper (CAT) on students' achievement in educational measurement and evaluation
2. Determine the effect of Muddiest (CAT) on students' achievement in educational measurement and evaluation
3. Compare the effect of CAT (One minute paper and Muddiest point) on students' academic achievement.

Research Questions
1. What is the difference between the pre-tests mean scores of students taught using One-minute paper and Muddiest point (CAT)?
2. What is the difference between the pre-test and post-test mean scores of students taught using One-minute paper (CAT)?
3. What is the difference between the pre-test and post-test mean scores of students taught using Muddiest point (CAT)?
4. What is the difference between the mean achievement scores in knowledge level of students using One-minute paper and Muddiest point (CATs)?

Null Hypotheses
Based on the objectives of the study, the following hypotheses were raised to be sustained or rejected through analysis of the data.
1. There is no significant difference between the pre-test and post-test mean scores of students taught using One-minute paper (CAT).
2. There is no significant difference between the pre-test and post-test mean scores of students taught using Muddiest point (CAT).
3. There is no significant difference between the mean achievement scores in knowledge level of students using One-minute paper and Muddiest point (CATs).

Methodology

This study adopted quasi-experimental research design of comparative study with the aim of comparing the effect of Classroom Assessment Techniques (CAT) on students' achievement in educational measurement and evaluation among undergraduate students. The populations of the study consisted of 247 third year undergraduate students of Federal College of Education, Okene, Kogi state in six departments, an affiliate of University of Ibadan, Nigeria, who took educational measurement and evaluation course. The internal consistency reliability of the validated test instrument was estimated using the KR-20 Formula, with a result of 0.86. Participants in experimental and control groups were pre-tested and post-tested using the same questions covering the topics and concepts from each course out line in order to assess knowledge of the participants before and after applying each classroom assessment techniques (CAT). Then, the participants were pre-tested at the beginning of the semester, after, those participants were randomly divided into two equal groups of 20 each, one experimental and another one control. Participants in the control group were taught using Muddiest point (CAT). They were given index card five minutes to the end of a topic of the course, and prior to introducing an important new topic. The students were required to write on what they found least clear or most confusing about the topic on their index card and hand over to their instructor. This helps the instructor to determine the most effective starting point for the lesson and the most appropriate level at which to begin instruction. While in the experimental group the participants were taught using One-minute paper (CAT). The instructor stops the class two to three minutes early and asks the students to respond briefly on the most important thing they have learned during the class. The students respond on index card and handed over to their instructor. This is done after the introduction of a new topic. This helped the instructor to know the level of students' understanding of the lecture. Following the completion of the course, at the end of the semester, a post-test was administered to all participants in both groups. The questions were initially explained by the researcher when handed out. They were asked to finish the questions independently based on their own learning conditions for 60 minutes. The differences in the pre and post-test scores were compared to assess improvement under the two classroom assessment techniques being applied in the section. A scoring rubric was used to evaluate students' constructed responses and the maximum score of each test was 20. In order to increase the internal and external validity in the experimental procedures the following factors are considered: The experimental and control groups were randomly selected without discrimination: two classes were designated, one was assigned as the experimental groups, and the other one was assigned as the control group. In this respect, it can be said that the characteristics of the students in the experimental and control groups were similar (subject characteristics). During the study, no subjects were lost from the experimental or control groups (loss of subjects). The data of the study were collected in their own classroom settings for both experimental and control groups. Therefore, there was no difference regarding the place where the data was collected (setting). Data collection tools did not change during the research procedure. Pre-test and post-test applications were carried out by the same teacher in both the experimental and control groups (data collection instruments). It can also be said that the use of the control group in the study reduced the testing effect (test effect). The fact that the research was carried out over a period of four months is considered to have reduced the "Hawthorne effect" (subjects' attitude). Teaching in the control and experimental groups was carried out in similar classrooms. The same teacher taught both groups. In addition, the researchers observed no differentiation between the experimental and the control groups with regard to the teacher's attitudes and behaviors toward the students. The data collected through pre and post-tests were put to statistical analysis using statistic package for social sciences (SPSS) Inc., Chicago, IL, United States,

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version 13.0 for Windows. In addition to calculating the descriptive statistics, paired samples t-test was run to see whether the participants' performances were statistically different on the pre and post-tests. Moreover, 2-tailed t-test was run to compare the participants' improvement on pre-test compared to post-test.

Results

Research Question 1: What is the difference between the pre-tests mean scores of students taught using One-minute paper and Muddiest point (CAT)?

Research Question 2: What is the difference between the pre-test and post-test mean scores of students taught using One-minute paper (CAT)?

Research Question 3: What is the difference between the pre-test and post-test mean scores of students taught using Muddiest point (CAT)?

Research Question 4: What is the difference between the mean achievement scores in knowledge level of students using One-minute paper and Muddiest point (CATs)?

Table 1: Difference between the pre-tests mean scores of students taught using One-minute paper and Muddiest point (CAT); difference between the pre-test and post-test mean scores of students taught using One-minute paper (CAT); difference between the pre-test and post-test mean scores of students taught using Muddiest point (CAT); and difference between the mean achievement scores in knowledge level of students using One-minute paper (CAT) and Muddiest point.

Group	N	Pre-test Mean	SD	Post-test Mean	SD	Mean Gain
Experimental	20	6.32	0.92	7.95	1.95	1.62
Control	20	6.32	1.32	6.43	1.35	0.11
Mean Difference		0.00	0.40	1.52	0.60	1.51

From the Table 1, no difference was found between pre-test mean scores of students in the experimental group (One minute paper) and those in the control group (Muddiest point). By analyzing the mean scores and standard deviations, it is clear that students in both the experimental group (X =6.32; SD=0.92) and the control group (X=6.32; SD=1.32) had the same initial levels of knowledge.

Data in Table 1 reveals that there was a difference between the pre-test mean score (X=6.32; SD=0.92) and post-test mean scores (X=7.95; SD=1.95) of the students in the experimental group (One minute paper) with the mean difference of 1.62. This simply indicates that students accomplished enough after studying through the One-minute paper (CAT).

Data in Table 1 also reveals that there was a slight difference between the pre-test mean score (X=6.32; SD=1.32) and post-test mean scores (X=6.43; SD=1.35) of the students in the control group (Muddiest point) with the mean difference of 0.11. This simply indicates that students in control group also show significant improvement after studying through Muddiest point (CAT).

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Table 1 still show case that there was a difference between the mean achievement scores in knowledge level of students using one minute paper and muddiest point (X=1.52; SD=0.60). By comparing the mean scores and standard deviations of the post-tests of the both groups, it points that students in the experimental group had (X=7.95; SD=1.95) demonstrated significantly higher levels of attainment than the control group (X=6.43; SD=0.60).

Null Hypothesis 1: There is no significant difference between the pre-test and post-test mean scores of students taught using One-minute paper (CAT).

Table 2: t-test on the Pre and Post-test of Experimental Group Paired Differences

95% confidence interval of difference							
Mean	SD	SE			t-cal.	df	Sig. (2 tailed)
Pre-test and Post-test---1.62	1.65	0.37	-2.39	-8.46	4.39	19	0.014

Significant at a = 0.05.

The data analysis in Table 2, reveals that the mean difference of scores between pre and post-evaluation (1.62) shows that the experimental group is significantly different when comparing pre and post-test marks (P = .014). This implies that the null hypothesis 1 was rejected, while its alternative hypothesis accepted, which indicates that there is significant difference between the pre and post-test mean scores of students studying through the One-minute paper (CAT). In this report, strong evidence is given to support that the One-minute paper (CAT) is highly effective.

Null Hypothesis 2: There is no significant difference between the pre-test and post-test mean scores of students taught using Muddiest point (CAT).

Table 3: **t**-test on the Pre and Post-test of Control Group Paired Differences

95% confidence interval of difference							
Mean	SD	SE			t-cal	Df	Sig. (2tailed)
Pre-test and Post test --.100	1.35	.302	-.73	.53	-.33	19	.745

Significant at a = 0.05.

The data analysis in Table 3, reveals that the mean difference of scores between pre and post-test (.100) shows that the control group has shown significant (.745) improvement in their performance in the post-test as compared to the pre-test. This therefore, rejects the null hypothesis 2, and accepted the alternate hypothesis 2 which reveals that there was significant difference between the pre and post-test mean scores of students taught through Muddiest point (CAT). The result of data analysis shown in Tables 1 indicates that both groups made significant progress during the course. Since it is not yet clear which group made more progress and shown improvement in their knowledge in this framework. For this purpose, comparisons of mean scores in post-tests are presented in the Table 4 below.

Null Hypothesis 3: There is no significant difference between the mean achievement scores in knowledge level of students using One-minute paper and Muddiest point (CATs).

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Table 4: t-test on the Post-tests of Experimental and Control Groups.

Post-test	N	Mean	SD	t-value	DF	Sig. (2-tailed)
Experimental	20	7.95	1.953	2.889	38	.006*
Control	20	6.43	1.310			

Significant at a = 0.05.

From the Table 4, the mean score of the experimental and control groups were 7.95 and 6.43 respectively, considered greater in experimental group. In addition, the difference of mean scores of both groups in pre and post-test (1.620 - 0.100 = 1.52) shows that post-test performance considered greater in experimental group when compared to the control group. As revealed in Table 4, the difference of mean scores between the two groups was significant (P = 0.006 < 0.05) at the level of confidence a = 0.05 as set by researcher. Additionally, there is strong evidence to reject the null hypothesis 3 which states that there was no significant difference between the mean scores in knowledge formation. Thus, the alternate hypothesis 3 considers significant difference between the mean scores in the knowledge formation applying Muddiest point (CAT) and the One-minute paper (CAT). This implies that One-minute paper (CAT) was more effective technique than Muddiest point (CAT) for improving knowledge of students in learning educational measurement and evaluation.

Discussion of Findings

This study investigated the comparative study of the effect of Classroom Assessment Techniques (One minute paper and Muddiest point) on student academic achievement in educational measurement and evaluation. . The students in both the experimental and the control groups were administered with the same test to know their initial level of knowledge on educational measurement and evaluation, and they demonstrated similar initial levels of knowledge. This proves that before the teaching of educational measurement and evaluation with CATs (One minute paper and Muddiest point), the knowledge levels of the students in both the experimental group (One minute paper) and the control group (Muddiest point) were equivalent.

After the intervention of CATs on the students, the same test was equally administered to the two groups to obtain their achievement level. Then, t-test of pre-test and post-test of the experimental (One minute paper) was conducted in order to determine the level of improvement and mean differences on the pre and post-tests of experimental group, and the result showed a significant difference (P=0.014) and mean difference of scores (1.62). This implies that students accomplished enough after studying through the One-minute paper (CAT).

Again, result of t-test of pre-test and post-test of control group (Muddiest point) to determine the level of improvement and mean differences was conducted and it indicates a significant difference (P=0.745) and mean difference of scores (0.100). This implies that participants in control group also show significant improvement after studying through Muddiest point (CAT).

However, the t-test analyses of pre-tests and post-tests of the experimental and control groups indicated that both groups made significant progress during the course. This finding is also in line with the findings of Mansson (2013); Nartgun (2010); Agrawal and Khan (2008); Hoegl (1999); and Cottell and Harwood (1998) who discovered that these CATs do make significant progress in their different fields of study. To determine the group that made more progress and shown improvement in their knowledge, comparisons of mean scores in post-tests of the groups was conducted using t-test analysis. The mean score of the

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experimental (One minute paper) and control (Muddiest point) groups were 7.95 and 6.43 respectively, as the experimental group is considered greater. The difference of mean scores of both groups in post-tests (1.620 - 0.1000 = 1.52) shows that post-test performance considered greater in experimental group when compared to the control group. The difference of mean scores between the two groups was also significant (P = 0.006 < 0.05) at the level of confidence a = 0.05 as set by researcher. This implies that One-minute paper (CAT) was more effective technique than Muddiest point (CAT) for improving knowledge of students in learning educational measurement and evaluation. This finding agrees with that of Ashakiran and Deepthi (2013), who detected that One minute paper is the most simple and effective technique that assesses the students' prior-knowledge, recall and understanding and that has been used more often or by more college teachers.

Conclusion

With respect to the findings of the study, it was concluded that One-minute paper (CAT) was more effective technique than Muddiest point (CAT) for improving knowledge of students in learning educational measurement and evaluation in a formative approach in higher institution. Since there was statistical difference of the post-tests of the two groups (1.52) at 0.05 level of significance.

Recommendations

Considering the findings of this study, the researchers recommended that:
1. One minute paper should be preferred in assessing the students' prior-knowledge, recall and understanding in difficult courses or subjects like educational measurement and evaluation and statistics as the case may be.
2. That Classroom Assessment Techniques (CATs) be used in higher institutions especially in teaching difficult courses.
3. Seminars and conferences should be organized for the teaching staff on how to effectively expose students on the concept and important of CATs instead of lecture methods as it will aid in improving learning, motivating learners and informing teachers.

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