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Evaluation Feedback as a Predictor of Students' Achievement in Technical Education (Pp 479-490)

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Abstract

The major purpose of evaluation is to assess the strength and weaknesses of the learner. Therefore, for evaluation to be meaningful, students should benefit from it. This paper dwelt on the impact the methods of reporting evaluation feedback have on the students' performance of cognitive learning tasks in block laying craft-practice in technical colleges in Delta and Edo States of Nigeria. It also investigated the attitude of students towards evaluation when the traditional and the comprehensive systems were adopted as a means of reporting students' performance. The study revealed that the traditional method of providing evaluation outcomes by the use of the composite letter grade or mark enhances limited cognitive achievement by the students. Paradoxically, the study also revealed that the comprehensive i.e. the detailed feedback method enhances effective cognitive achievement than the traditional method. Furthermore, the study revealed that students who received comprehensive feedback have more positive attitude towards evaluation than those students whose feedback information were of the traditional letter grade or marks. The study therefore recommended that teachers of vocational/technical subjects should utilize the comprehensive feedback system so as to enhance their students' academic gains.

Keywords: Predictor, traditional evaluation, evaluation feedback, composite mark, random assignment, randomized cluster.

Introduction

Education is basically supposed to produce desirable changes to the learner (Ogunboyede, 2003a). These changes could be directly or indirectly observable or could even be unobservable. Thus, the overall purpose of an educational process is not the award of a certificate but the acquisition of knowledge or skills, which can be used in a real life situation for the benefits of the individual, and that of the society at large (Skinner, 1996; Hans-Gunner, 1998, and Abanikannda, 2002).

Nevertheless, the real test of the quality of any educational programme is how the people trained perform in their places of employment. Thus, the sponsors of educational programmes need to find out if the intended changes or behavioural outcomes have equally taken place, hence, the need for evaluation of teaching-learning process to determine academic achievement. Evaluation according to Okoro (1991), is the appraisal of the worth or value of a thing or action and the making of appropriate decision on the basis of such appraisal. It is also viewed as the process of passing judgement on the scores obtained through judgement (Hans-Gunner, 1998). It involves making assessment of the quality of an educational programme by interpreting the data collected.

Evaluation could be formative, if it is done along the teaching/learning process or summative, if it takes place at the end of a given period of instruction. Evaluation is important to determine the effectiveness of the process of learning and development in order to plan wisely for the next steps of instruction (Skinner, 1996). These appraisals should be made periodically during the learning period as well as at its completion. The reports from these evaluations find wide application in current guidance, future guidance, transfer of students, and many other functions of the school. Therefore, regular classroom evaluation is necessary for the child to realize his or her future dream, as it would enable the teacher to identify and plan remedial actions for the weak points or areas in the learning process of the child.

Overview of Evaluation

Evaluation has been defined as the process through which students' performance and programme effectiveness are assessed (Kissok, 1981; Oyekan, 2000, Abanikannda, 2002). Yoloye (1978), sees evaluation as the

assigning of some values to an entity in relation to some criteria, which can change in accordance with the prevailing circumstances. Tyler (1971) and Alonge (1989), asserted that, evaluation is the process of determining the extent to which the educational objectives are actually being realized while Stiggins (1992), believes that evaluation is an indispensable instrument as far as the teaching/learning process is concerned. It is not enough to formulate objectives/aims, select learning experiences and content and consider all the guidelines in organizing the learning experiences and content. There is the need to ascertain whether the learning experiences and content so organized do achieve the stipulated purposes. It is necessary to note areas of strength and/or weakness and concludes as to whether or not, the programme was a success or failure or need modification.

Stake (1971) sees evaluation as a process of describing and judging educational programmes based on a formal inquiry process while Stufflebean (1971), defines evaluation as a process of defining, obtaining and using information for decision making. It is also a process of comparing performance against students to determine whether to improve, maintain or terminate a programme (Skinner, 1996; Hans-Gunner, 1998).

Nwana (1982), identified four central features of evaluation as;

- i. an appraisal that leads to the making of judgements;
- ii. Such judgements are made in the light of some criteria;
- iii. Criteria must be appropriate to some particular contents;
- iv. Such contexts embody human purposes, and evaluations made therefore, inform decisions.

Evaluation as a means of assessing success or failure has been our way of life. Human beings from birth are constantly being evaluated by parents, bigger brothers and sisters as they learn to sit upright, crawl and at later stages of growth when they learn to walk and talk.

In adult life, people at one moment or the other in their life try to assess the success or non-success of what they do. A student assesses his/her success or otherwise in schooling; a businessman evaluates his merchandizing policies and a lawyer re-examines his legal success in the law courts and a politician re-examines his achievement in government. To evaluate the effectiveness of these endeavours, information by way of feedback is essential for accurate evaluation and assessment.

In the school system, various reasons have been adduced for evaluating students' attainment. According to Ali, Ezeadi and Ogbazi (1980) evaluation provide the following functions.

Information to parents on pupil status or progress; promotion and graduation; motivation of school work; guidance of learning; guidance of educational and vocational planning; guidance of personal development; reports and recommendations to future employers.

Holloway and Wolansky (1985) were in total agreement with Ali, Ezeadi and Ogbazi (1980) but they also had other observations to make.

Many educators would agree that one of the functions of evaluation is to measure the efficiency of instruction and to improve its effectiveness... it enables teachers to analyze failure very specifically. Repeatability, utilizing control factors over a long term, should yield edificial information to the evaluator.

Other writers who had given reasons why schools evaluate students were Mehwers et al (1977) and Lewy (1977).

Probably the most common or traditional method of reporting students achievement is the use of the five-point scale of A B C D E F or excellent, Good, Satisfactory, Pass, Fail or 1,2,3,4,5. This traditional evaluation system FRN (1985) observed contains six fallacies. These are;

The mark is an effective conveyer of information; anyone can achieve any mark he wishes if he is willing to make the necessary effort; people succeed in out-of-school life about as they do in school; the mark is rightly comparable to a pay-check; marking practices provide a justifiable introduction to competitive adult life and the mark can be used as a means without it eventually being as an end in itself.

To further buttress the inherent weakness in the use of the traditional evaluation feedback system of a composite mark or grade, Bloom et al (1971) remarked:

A simple communication of a single grade of C merely tells a student that in some fashion or the other he is not such a

“big egg” as others. It gives little information with which he can do anything. Similarly... a mark of 76 gives the student very little guidance for making corrections in his behaviour.

Evaluation in education generally and in vocational/technical education in particular should explore other methods of evaluation instead of sticking to the traditional evaluation system of summative evaluation in the form of grade or composite mark. One of such methods of evaluation is the comprehensive feedback. The philosophy of this system is that of believing that a student should be graded both in comparison with his own ability and in relation to others.

Recent research studies in education tend to indicate that more detailed feedback, that is comprehensive feedback can be more beneficial for helping students to identify their specific learning achievements or weaknesses. One of the advocates of this comprehensive feedback is FRN (1985). Recommending this system, it was stated as follows.

The system embodies many desirable factors and is therefore highly recommended. It is certainly much more adequate than other systems in meeting the informational functions; that is, it is attempting to give meaning to pupils and to parents as to the student's performance in relation to his own ability and in relation to the achievement of others. It motivates both the better and the poorer pupils.

On the basis of the observations of Ogomaka (1984) and Bloom (1971) and the recommendations of FRN (1985) a more comprehensive system of evaluation should be preferred to the traditional system especially in vocational/technical education where psychomotor domain is part of the elements to be evaluated. To accept the comprehensive evaluation feedback as a process of evaluation in vocational and technical colleges, a study of its potentials need to be documented.

Purpose

The main purpose of evaluating performance in school is to maximize learning achievement. To achieve this objective, therefore, the learner, should have a complete picture of his performance in relation with his ability and to other students relative to the variety of school subjects. In vocational/technical education and in education generally, the traditional feedback system of assigning a composite grade of an “A” or “B” etc. or a

composite mark of 80,50 etc are common methods of providing evaluation feedback to students in Nigerian schools.

The main purpose of this study was to find out if a change in method, that is from the traditional evaluation feedback to a comprehensive evaluation feedback would enhance the cognitive achievement of students and improve their attitude toward evaluation. In pursuance of the purpose of the study, the following null hypotheses was formulated at .05 and .01 level of probability respectively

HO₁: There is no difference in cognitive achievement of students when their performance is reported to them using the traditional feedback methods or the comprehensive feedback method,.

HO₂: There is no difference in the attitude of students toward evaluation feedback using the traditional or the comprehensive methods in reporting the cognitive performance.

Methodology

A preliminary study carried out in Delta and Edo States of Nigeria during the first term of 2007/2008 session by the researcher provided a feasibility evidence for carrying out the study. There are ten technical colleges in the two states, seven of which had at least two classes of Block laying (Construction of Block/Brick wall) in the workshops. The total student population in the block laying workshops in the seven technical colleges were 205.

The study sample consisted of 153 second year Block laying students. In each of the classes, students participating in the study were randomly selected. The number of participating students selected from each class depended upon the population of each class.

A post-test only randomized block design was used for the study (Keppel, 1973). This permitted the utilization of intact classes with extraneous variable controlled by blocking (schools) and randomized cluster assignment (classes) Borgand Gall (1979). For each school the same teacher taught both second year of Block laying (construction of block/brickwall) practical classes.

By random assignment, a class in a particular school was either assigned the traditional evaluation feedback and the other class in the same school was assigned the comprehensive evaluation feedback. In this way a morning or afternoon class was selected to receive the minimum evaluation feedback by

using the traditional evaluation system of letter grades. The complementary afternoon or morning class in each school received the comprehensive evaluation feedback which showed the student's score, maximum, possible score, class average, for all the items in the assigned project. Also at each participating school, the workshop, classroom procedures, policies and teaching aids (text-books, visual aids, assignment sheets) were the same for each of the two classes. The standard textbooks used in all the seven schools was Brickwork I by W. Nash 3rd ed. 1983. This very standard textbook was used by the researcher in developing the test items.

Tests specifically designed by the researcher to measure cognitive achievement based on course content and programme objectives were prepared and used as evaluation instruments. Multiple-choice test items were developed on the basis of a comprehensive analysis of the module objectives included in the experiment. To ensure content validity, the multiple-choice tests items were distributed to a group of vocational/technical teachers in the various technical colleges who are specialists in Block laying craft practice. As a result of the validity review by the specialists, 50 objective test questions were selected for each of the first two competency examinations.

The competency examinations were two comprehensive achievement tests administered by each teacher at the end of his six week teaching. The final competency examination was used for comparing mean achievement scores between the maximum and minimum feedback groups. To achieve the reliability, this final examination consisted of 50 selected questions from the first two examinations. Using Kuder-Richardson 20 formula to post-test scores, a reliability coefficient of 0.88 was obtained.

Just before administering the final competency examination, all students who were involved in the study completed an attitude inventory regarding the feedback they had received. The inventory contained five Likert scale item statements about the examination results. Reliability analysis of the attitude instrument items revealed a coefficient alpha of 0.80.

In carrying out the experiment, each teacher after completing the teaching of each module, administered a comprehensive examination utilizing the 50 selected objective test items. The three comprehensive competency examinations were given at six weeks intervals. The levels of performance were established by feedback students received for each of the first two examinations and composite scores form the third cognitive test. These three

comprehensive achievement scores were then used for comparing the mean achievement between the two treatment groups.

Tables 1 and 2 represented an attempt to test the first hypothesis (i.e. there is no difference in cognitive achievement of students when their performance is reported to them using the traditional feedback methods or the comprehensive feedback method. This first hypothesis which stated that no difference existed between using the traditional feedback method and the comprehensive feedback method was rejected. Table 1 showed that significant differences existed between the two treatment variables.

To find out whether the differences between the two groups were as a result of differences between the various schools, the achievement test results of the morning and afternoon classes in each school were compared. Table 2 showed that within schools minimal differences only existed whereas a higher mean achievement scores were recorded for the groups using the comprehensive feedback evaluation system. Table 2 therefore further support the existence of difference and the rejection of the first hypothesis.

The second hypothesis postulated by the study was that no difference existed in attitude of students toward evaluation irrespective of whether the traditional or the comprehensive feedback system was used in reporting their cognitive performance.

To test this hypothesis, a completed attitude inventory by the two groups were analysed using a two-way analysis of variance (Table 3). The result of the analysis showed significant difference between the two groups. This means that the two groups differ in their attitudes toward evaluation. In an effort to identify which of the two groups had more positive attitude toward evaluation information they received, the attitude scores within school were compared. Table 4 clearly indicated that the second hypothesis was rejected and that differences in attitude towards evaluation feedback existed between the two groups of students.

Results and Discussion

Table 1 represents the results from the statistical analysis of cognitive achievement data.

For a one-tailed test to be significant at the 0.05 level with 1 and 139 degrees of freedom, an F-value of 2.71 is required. As indicated in Table 1, the obtained F-ratio for the treatment variable was 4.40.

Furthermore, as indicated in Table 1, the obtained F-ratio for the control variable was only 1.26. For significance at the 0.05 level an F-value of 2.10 is required.

In general as may be observed from Table 2 classes receiving maximum or comprehensive feedback had higher mean achievement scores than classes receiving minimum or the traditional examination results feedback. However, among the participating schools, the mean achievement scores were similar.

Table 3 represents results from the statistical analysis of attitude scale scores.

For a one-tailed test to be significant at the 0.01 level, with 1 and 139 degrees of freedom, an F-value of 5.17 is required. As indicated in Table 3, the obtained F-ratio for the treatment variable was 11.64

Table 4 shows that most of the classes receiving maximum or comprehensive feedback had higher mean attitude scale scores than the classes receiving minimum or traditional feedback examination information..

Conclusion

For this study, schools were used as a blocking variable to control differences that might exist between them. Additionally to ensure freedom from experimental bias, the two levels of treatment were randomly assigned to intact school classes. However, a limitation of the study is that the researcher was unable to randomly assign students to classes. It may be inferred from the data in Table 4 that the study's single level randomization was not sufficient to eliminate all of the inconsistencies that could cause interaction between the treatment and control variables.

This study, however, showed that students receiving comprehensive evaluation feedback of their examination results rather than the traditionally less-comprehensive feedback in terms of mere letter or numerical grades obtained a significantly higher level of cognitive achievement.

Also their attitude toward the assessment process was more favourable. Accordingly, based on this study, it is recommended that teachers of vocational/technical subjects should provide comprehensive performance feedback for students to enhance their academic achievement in learning situations.

Table 1: Two-Way Analysis of Achievement Variance

Source	Df	Ss	Ms	F
Treatment (Feedback levels)	1	327.25	327.25	4.40*
Control (schools)	6	562.75	93.79	1.26
Interaction	6	757.86	126.31	1.70
Error	139	10327.70	74.30	

* Significant at the 0.05 level

Table 2: Cell Means for Achievement Data

	Maximum feedback		Minimum feedback		N	School
	N	Mean	N	Mean	N	Mean
School 1	16	42.56	12	36.75	28	40.07
School 2	8	38.37	15	33.86	23	35.42
School 3	11	36.27	6	32.50	17	34.94
School 4	7	31.00	4	42.75	11	35.27
School 5	10	39.80	12	28.58	22	33.68
School 6	5	37.80	11	35.27	16	36.06
School 7	26	40.69	10	36.60	36	39.55
Treatment	83	39.14	70	34.45	153	36.99

Table 3: Two-Way Analysis of Attitude Variance

Source	Df	Ss	Ms	F
Treatment (Feedback levels)	1	285.18	285.18	11.64**
Control (schools)	6	1380.83	230.14	9.39**
Interaction	6	839.34	139.89	5.71**
Error	139	3405.39	24.48	

* Significant at the 0.01 level

Table 4: Cell Means for Attitude Data

	Maximum feedback		Minimum feedback		N	School
	N	Mean	N	Mean	N	Mean
School 1	16	19.66	12	18.00	28	18.95
School 2	8	21.87	15	19.64	23	20.42
School 3	11	21.63	6	18.83	17	20.64
School 4	7	22.57	4	23.50	11	22.91
School 5	10	19.60	12	19.18	22	19.37
School 6	5	22.80	11	23.37	16	23.12
School 7	26	18.56	10	6.10	36	15.10
Treatment	83	20.22	70	18.07	153	19.23

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