

THE EFFECT OF DIFFERENT TYPES OF FEEDBACK ON THE QATARI STUDENTS' ACHIEVEMENT

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SUMMARY

The effect of verbal/written (A), Individual/group (B) types of feedback and their interaction (AB) on achievement was investigated. The subjects were 68 Qatari undergraduate females enrolled in the author's course on measurement and testing. They were selected and assigned randomly to the four treatments (verbal-individual, written—individual, verbal-group and written group). All the subjects' achievement was assessed before and after delivering feedback. By using a two-way analysis of covariance, it was found that there were no significant differences among samples due to treatment (A) or (B) or to their interaction (AB).

Feedback is one of the most common and useful practices used by teachers in classrooms. The use of mastery learning strategies with their emphasis on feedback/corrective procedures, has further highlighted the power of feedback as an instructional tool (Edmonds, 1978).

Feedback as an instructional tool has been an area of interest and importance because of its role. This role can be considered as ranging along a continuum from providing the learner with the simplest yes-no format to the presentation of substantial corrective response content, or even add new material to it. Hence, as one advances along the continuum, feedback complexity increases until the process itself takes on the form of new instruction, rather than informing the student solely about correctness (Kulhaiy, 1977).

Accordingly feedback helps enhance learning (O'Neill, 1976, Kulhaiy, 1977; Fredick, 1979) either because of its corrective function, or because it provides the student with a response confirmation which serves as a motivational factor for learning (Scherer, 1974) or because it effects the learner's attention (Barringer & Ghoslon, 1979) and retention (Beck, 1979).

Although there is considerable evidence that feedback enhances learning,

inspection of the literature shows that various types of feedback have been used, but that few systematic studies of the specific effects of these types have been carried out. This is specially true in the cases of such studies in the Arab World such as: verbal/written, individual/group and their combinations have been carried out. This is especially true in the case of such studies in the Arab world.

After reviewing the literature Barringer and Ghoslon (1979) concluded that verbal and symbolic feedback produce more rapid acquisition than tangible feedback. Also Tumblin and Ghoslon (1981) after reviewing the literature about the factors that effect the development of conceptual learning concluded that performance is most efficient if feedback is verbal or symbolic and delivered in a right-wrong or wrong-blank combination that includes an attention-direct component.

As for written feedback Page (1958) and Sweet (1966) both demonstrated that teacher written free comments which were personal to the learner, had significantly more effect on student achievement than general comments applied to all students. Also Schoen and Kreye (1974) reported a significant advantage on achievement measures for written corrective feedback which was response specific for individual students, compared with written feedback of a general nature.

In regard to individual/group feedback Hall(1957) and Pryer and Bass (1959) conducted two experiments in which they provided subjects either with individual (direct) or with group (confounded) feedback. They found that the two types did not lead to differences in team performance. Sassenrath and Garverick (1965) provided three types of feedback to three experimental groups, besides a control group (no feedback). The types of feedback were looking up wrong answers in the textbook (written-individual) or having answers discussed by the instructor (verbal-group), or checking over answers from correct ones on the board. It was found that subjects in all three experimental conditions obtained significantly higher scores on a retention test than the control group. The discussion method (verbal-group) was superior to the group who looked up answers in the text book (written-individual). The superiority of verbal-group feedback was also reported by Wexley and Thornton (1972). They found that verbal-group feedback showed significant effects on learning than no feedback, and that effect continued as much as nine weeks later. Edmonds (1978) used two types of feedback (verbal-written and individual/group) and found that verbal feedback had a significantly greater effect than written feedback on student achievement. But there was no statistically significant difference between the effect of individual and group feedback on student achievement. Besides there was no significant interaction between verbal/written feedback and individual/group feedback on student achievement.

The above reviewed studies — except Edmonds — dealt with some types of feedback (verbal/written and or individual/groups) but did not investigate them in a way that declares the effect of each and the interaction between them. Therefore, the purpose of this study is to investigate the effect of:

- a. Verbal/written feedback (A) On Qatari students' achievement.
- b. Individual/group feedback (B).
- c. The interaction between (A) And (B) treatments (AB).

Feedback in this study means that the teacher provides the student with knowledge about the adequacy of his/her responses, gives reasons for inadequate responses, the correct response, and reason for the appropriateness of a response. If feedback is provided orally on a one to one basis, it is termed verbal-individual. If it is provided in a written form and a one to one basis, it is termed written-individual. If feedback is given orally and includes the common errors of the group (items which more than 50% of the students got wrong), with information about the achievement mean and standard deviation of the group, it is termed verbal-group. But if it is given in a written form and includes the common errors in the group (items which more than 50% of the students got them wrong), with information about the achievement mean and standard deviation of the groups, it is termed written-group.

METHODS

Subjects:

The population of this study consisted of under-graduate females majoring in education at the University of Qatar who were enrolled in the author's class for measurement and testing during the second semester of 1982. The population size was 106 students.

The subjects were randomly selected from the stated population and randomly assigned in equal numbers to treatments (verbal-individual, written-individual, verbal group and written group).

The age range of the subjects was 19-25 years with a mean of 20.9 years and standard deviation of 4.3 years.

The sample size was determined according to Cohen's (1977) procedure. To determine the size of each of the four samples, where $K=4$ and $u = K - 1=3$, the power of the statistical test, and the desired effect size of the treatment must be given. For this study alpha selected is .01, the power of the statistical test is .99, and the selected effect size is .60. By using the tables and applying the formula developed by Cohen, the sample size that met the previous conditions was 17 in each cell. Therefore, the total N was 68 subjects.

The effect size or the departure from the zero effect, in terms of standard deviations of the standardized K means, is selected at .60 because according to Cohen if the effect size is .10 it is considered small, or .25 it is considered medium, and .40 is considered large.

Design:

Completely randomized factorial design was used in this experiment. The independent variables are verbal/written and individual/group types of feedback. This design yields four samples: verbal-individual, written-individual, verbal group and written group.

The dependent variable is achievement measured by an objective test about the basic principles of testing and measurement.

Instruments:

To measure achievement two multiple choice equivalent forms of a test were used. Each form consisted of 25 items that were content valid. The reliability

of the test was .62 which is considered acceptable because of the factors that affect this kind of reliability (Thorndike & Hagen, 1961).

The forms of the test were used before the experiment with similar samples during 1980 and 1981. That helped to refine the items and improve its validity.

To provide the students in the two written groups with feedback, written answer sheets with comments about the appropriateness of the correct response and the inappropriateness of other alternatives were prepared. The answer sheets differed according to the two kinds of written treatments used.

Procedure:

None of the subjects in the sample had any formal instruction in measurement and testing. The population were told that they were involved in a study about feedback, and that their participation was voluntary and would not affect their course grades.

The material selected was taught to the population by the author. Then the students were tested using the first form of achievement test. That was considered as pre-test.

The four samples were selected and assigned randomly to the treatments. Then each sample received their graded tests followed by the proper feedback by the author.

Immediately following feedback subjects were tested using the second form of the achievement test. That was considered as post-test.

Two way analysis of covariance (Bruning & Kintz 1968) was used to analyze the scores on the post test which were used as a dependent variable. While the scores on the pre-test used as a covariate.

RESULTS

Since there is no previous reasearch about the effect of the two treatments selected and their interaction on students' achivemement in Qatar, the following null hypotheses were tested.

1. There are no statistically significant differences among the samples' achievement due to treatment (A).
2. There are no statistically significant differences among the samples' achievement due to treatment (B).
3. There is no statistically significant interaction (AB) between A and B.

On analyzing the data the three null hypotheses were accepted. Table (1) includes the results of the analysis, and table (2) presents X — and S. D for each of the four samples.

Table (1)**Analysis of covariance for achievement scores**

Source	Adj. SS.	df	MS	F	Sig.
(A) Verbal/written	9.63	1	9.63	.68	Non
(B) Indiv./group	9.3	1	9.3	.65	Non
(AB) Interaction	4.07	1	4.07	.79	Non
Error	895.45	63	14.2		

Table (2)**Samples' means and standard deviations
for achievement**

B \ A	Verbal			Written	
		Pre	Post	Pre	Post
Individual	X	13.2	20.12	13.5	19.1
	S.D.	4.5	4.6	3.2	3.8
Group	X	12.4	19.9	12.5	19.7
	S.D.	4.2	4.04	3.9	4.9

The analysis indicated that treatment (A) did not significantly effect the dependent variable, or whether feedback was provided in a verbal or written from it did not lead to significant differences in the achievement of the samples. Also treatment (B) did not significantly effect the dependent variable, or whether feedback was provided in an individual or group form it did not lead to significant differences in their achievement. Besides there was a non-significant interaction between (A) and (B) treatments, or that the interaction between the types of feed-back did not lead to significant differences in the achievement of the samples.

DISCUSSION

The results obtained can be interpreted by subjects' motivation. Students might have considered that their participation in the experiment would affect

their course grades. This means that the nature of the material used in the experiment, as related to the course, might have interacted with students' motivation to effect their performance.

The subjects were students in the College of Education and were acquainted with educational and psychological concepts and principles, and practice teaching in schools. This might have helped them develop a positive attitude towards feed back. This contention can be supported by examining the subjects' attitudes towards feedback treatments. To measure students' attitudes, an attitude scale was developed using the semantic differential concept (Osgood, Suci and Tannenbaum, 1957). Four adjective pairs were used with a scale of 7 points for each. The adjective pairs were good-bad, valuable-worthless, important-unimportant and successful-unsuccessful. The adjectives were used because Tannenbaum (1966) found that they load highly on the evaluative dimention when related to educational concepts.

The attitude scale was administered two times, the first before feed-back and the second immediately after feedback. The scores were analyzed using two way analysis of covariance and Table (3) shows the results.

Table (3)

Analysis of Covariance for subjects' attitude scores towards feedback

Source	Adj. SS	df.	MS	F	Sig.
(A) Verbal/Written	7	1	7	.625	N.S
(B) Indivi./groups	7.8	1	7.8	.696	N.S
(AB) Interaction	Zero	1	Zero	Zero	N.S
Error	705.9	63	11.2		

Table (4)

Means, standard deviations and test for students' attitude scale

B \ A		Verbal				Written				
		Pre	Post	t	Sig.	Pre	Post	t	Sig.	
Individual	\bar{X}	24.6	24.9			\bar{X}	23.9	23.8		
	S.D	5.1	4.1	1.4	N.S.	S.D	9.4	4.4	.13	N.S.
Group	\bar{X}	24.5	24.5			\bar{X}	23.5	2.3		
	S.D.	3.09	3.4	1.08	N.S.	S.D.	2.7	3.38	.73	N.S.

From Tables (1), (3) and (4) the following conclusion can be drawn. It is probable that feedback treatments did not affect the students' achievement because they had positive attitudes towards feedback in spite of its type. Kulhaiy (1977), Clifford (1978) and Cooper (1978) found that feedback affects subjects' expectations. This was also found in this study. Subjects were asked twice to estimate their expected scores on the achievement test, the first before the pre-test and the second before the post-test. Table (5) shows the means, standard deviations and t test (for correlated samples) between the two sets of estimated scores.

Table (5)
Means, standard deviations and t test
for students' expected scores

A \ B		Verbal				Written				
		Pre	Post	t	Sig.	Pre	Post	t	Sig.	
Individual	\bar{X}	17.1	21.4	5.6	.001	X	18.1	20.86	2.594	.02
	S.D	2.73	2.98			S.D	3.77	2.56		
Group	\bar{X}	18.12	20.71	2.22	.05	X	18.27	19.3	.849	N.S
	S.D	2.2	3.99			S.D	3.7	3.25		

Table (5) shows that feedback raised students' expectations in general. This effect was significant for verbal-individual, written-individual and verbal-group, but not for written-group.

When the effect of feedback types on subjects' expectations was examined using two-way analysis of covariance, the treatments (A) and (B) and their interaction (AB) did not show significant differences among groups (Table 6)

Table (6)
Analysis of covariance for subjects expected scores

Source	Adj S.S.	df	MS	F	Sig
(A) Verbal/written	17.22	1	17.22	1.64	N.S.
(B) Indivi./group	22.86	1	22.86	2.18	N.S.
(AB) Interaction	2.49	1	2.49	.24	N.S.
Error	662.44	63	10.5		

From Tables 1, 5 and 6 the following conclusion can be drawn. Feedback types did not significantly affect students' achievement perhaps because the types affected students' expectations nearly the same.

Kulhauy (1977) indicated that feedback would have no effect if the test material used allows learners to see feedback before responding. This helps interpret the non significant effects of treatments on students' achievement. The subjects had the same text material which they could examine before and after responding, also before providing them with feedback. This means that feedback had high availability for learners to the extent that it nearly equalized the effect of feedback types.

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