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EFFECT OF FEEDBACK ON THE LEARNING OF SCIENTIFIC CONCEPTS ACROSS INTELLIGENCE AND SOCIO-ECONOMIC STATUS

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Abstract:

The research paper is focussed to find the effect of the positive feedback and no feedback variables on the achievement in science of X+1 students of high and low intelligence, high and low socio-economic status by factorial design. The analysis of data with the help of analysis of variance technique found that achievement score of subjects under high intelligence was higher as compared to low intelligence group whereas SES was not found to be significantly influencing the learning of scientific concepts and for feedback it was found to be significant. The study showed superiority of feedback group over no feedback group. High intelligence and feedback group gain higher scores as compared to the other groups. The interaction involving intelligence, SES and feedback was found to be influencing the learning of self-concepts Results indicated that achievement of high intelligence, high SES and feedback group was higher than all other groups.

Keywords

Scientific creativity, feedback, socio-economic status, intelligence, concept learning, scientific concepts, learning, achievement in science, X+1 students

Introduction

Without the general understanding of science, scientific material and scientific inventions, the civilized life will become impossible in the near future. That is why Indian Education Commission (1964) rightly pointed out that science and mathematics should be taught on a compulsory basis to all pupils as a part of general education

during the first ten years of schooling. But, in spite of all these, still India has to develop a

lot to keep in pace with the advanced countries. Keeping in view the importance of science, the investigator has chosen this field for investigation.

Hunt (1966) defined concept learning as acquisition or utilization or both of a common response to dissimilar stimuli.

It has been supported by many studies that intelligence plays a significant role in learning of concepts and high achievers possessed superior intelligence (Lalithamma, 1975; Gakhar, 1984)

Similarly, Dave and Dave (1971) and Vijaylakshmi (1980) revealed that achievement is positively related with the socio-economic status of the children.

Giving feedback in periodic tests has been advocated as an instructional aid on the ground that feedback and knowledge of results facilitates learning (Guthrie, 1977)

Methodology

In the present study a complex factorial design of analysis of variance incorporating three variables in 2x2x2 pattern was employed. Variable of intelligence was varied on two ways as high and low; socio-economic status was varied as high and low SES; feedback was varied as positive feedback or no feedback.

Sampling technique was used at three places. In the initial stage intelligence test was given to 264 students (science group) taken from X+1 class from Patiala district of Punjab State. At the second stage , SES scale was given to only high intelligence group (top 27%) and low intelligence group (bottom 27%) divided on the basis of high SES and low SES and thus making four groups , namely High intelligence-High SES ; High intelligence-Low SES; Low intelligence-High SES; Low intelligence-Low SES. Then each of these four groups were divided in to two groups, one group was given positive feedback and the other group as no feedback. Thus making total eight groups

Tools

1. Group test of General Mental Ability (Tandon,1971)
2. Socio-Economic Status Scale (Kulshreshta,1980)
3. Achievement Test in Science for X+1 (Rajnish,1998)

Analysis of Data and discussion of Results

Data was analysed with the help of analysis of variance technique

Table 1: Table showing results of 2x2x2 three ways analysis of variance.

Source	Total sum of squares	Df	Mean square variance	F-ratio	Level of Significance
Intelligence	22.70	1	22.70	9.22	.01
Socio-economic status	10.84	1	10.84	4.40	Not Significant
Feedback	143.40	1	143.40	58.29	.01
Int x SES	3.01	1	3.01	1.22	Not Significant

Int x FB	15.98	1	15.88	6.49	.01
SES x FB	9.27	1	9.27	3.76	Not Significant
Int x SES x FB	133.58	1	133.58	54.30	.01
Within	125.46	51	2.46		

For the variable of intelligence, F- ratio was found to be significant at .01 levels. It was found that mean score of subjects under high intelligence was higher as compared to low intelligence group.

Variable of SES was not found to be significantly influencing the learning of scientific concepts due to insignificant F-ratio.

For feedback variable F-ratio was found to be significant at .01 level. The gain in score in case of feedback groups showed superiority of feedback group over no feedback group.

Out of all the interaction, only one interaction i.e. intelligence x feedback was found to be significant at .01 level. The result indicated that a particular level of intelligence may combine with a particular level of feedback for good or bad results of concept learning. However, in the present study high intelligence and feedback group gain higher scores as compared to the other groups.

Second order interaction involving intelligence, SES and feedback was found to be influencing the learning of self-concepts due to significant F-ratio. It means a particular level of SES may yield better results under a particular level of feedback. Results of present study indicated that

achievement of high intelligence, high SES and feedback group was higher than all other groups.

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