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REVIEW ARTICLE

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Cognitive Style In Relation To Academic Achievement

Manish Sharma

Research Scholar, PhD (Education), Pacific University, Udaipur

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In recent years, research in teaching-learning process has increasingly shifted its emphasis from predictive studies of success and failure in performance to the understanding of cognitive processes that underlie the performance. Prediction of success and failure in academic performance could be of secondary importance to the insight into the basic cognitive processes that account for either of these terminal behaviour.

STYLES OF THINKING

The main part of Wallach and Kogen's study was an exploration between what they referred to as intelligence (measured by conventional reasoning tests) and creativity (indicated by responses to open ended questions requiring imagination and fluency rather than analytical skills).

A similar distinction in terms of scores on tests of convergent and divergent thinking was made by Hudson (1966) who coined the term 'converges' and 'diverges' to describe styles of thinking related to contrasting preference for subject areas and personality attributes.

STYLES OF LEARNING

A more recent way of describing differences in cognitive style is that proposed by Pask (1976). He has used problem solving tasks to contrast wholist and serialist strategies of learning. The wholist tends to view the task as a whole, to see interconnections between even tenuously connected ideas, and to make avid use of illustrations, anecdotes and individualistic analogies. The serialist has a narrower focus in carrying out the learning task, prefers cautious step by step procedure, and relies more on detailed fact and evidence in building up an argument.

COGNITIVE STYLES AND TEACHING - LEARNING PROCESS

The past three decades have seen a vast amount of research on cognitive styles, and it is a tribute to the value and vigour of this effort that, increasingly, the concepts and methods derived from cognitive styles research can be fruitfully applied to a very wide array of psychological issues. Perhaps the most promising and exciting prospects for a cognitive style approach lie in the field of teaching- learning process. While relatively little research has been done, compared to what is possible and needed, it is already clear that cognitive style is a potent variable affecting a number of areas: the students' academic choices and vocational preferences, the students' continuing academic development, how students learn and teachers teach, and how students and teachers interact in the class room. A host of studies carried out by western researchers have amply proved that cognitive style of the student contributes a lot in learning of various subjects. For example, Wilson (1981) reported that cognitive style may be related to students' performance; inappropriate matching of style may lead to under-achievement or transfer to more compatible academic fields. Witkin (1976) emphasized that cognitive style has been found resulting in high academic achievement in particular subject matter areas.

According to Witkin et al. 1977, "field independence Vs field dependence cognitive style refers to a consistent mode of approaching the environment in analytical, as opposed to global terms. It denotes a tendency to articulate figures as discrete from their backgrounds and a facility in differentiating objects from embedding contexts, as opposed to a counter tendency to experience events globally in an un-differentiated fashion. The field independent pole includes competence in analytical functioning combined with an impersonal orientation, while the field dependent pole reflects correspondingly less competence in analytical functioning combined with greater social orientation and social skills.

More recently Witkin et ale have preferred the term "psychological differentiation". Others have called the same characteristic field articulation. But whatever the particular term used, what the differences between individuals reflect is the way in which people deal with a complex, confusing situation in which some cognitive response is expected.

The following tools were finally selected and used by the investigator in the study:

1. The Group Embedded Figures Test (GEFT).

2. The Standard Progressive (SPM).

Academic achievement was noted from the official records of the institutions concerned in terms of aggregate marks as obtained by each of the subjects in 10th class examination.

STATISTICAL TECHNIQUES

In the present study, two statistical techniques namel Analysis of Variance (ANOVA) and 't' test were used to analyse the data pertaining to cognitive style of various groups of adolescent students.

COGNITIVE STYLE OF ADOLESCENT STUDENTS IN RELATION TO THEIR ACADEMIC ACHIEVEMENT

In order to study the difference in cognitive style of adolescent students belonging to high, average and low academic achievement, F-ratio was calculated and the same has been reported alongwith other statistics in Table 4.5.

TABLE 1(4.5)

Summary of Analysis of Variance with respect to Cognitive Style Scores of Adolescent Students Belonging to High, Average and Low Academic Achievement Groups

Source of Variation	df	Sum of Squares	Mean Square	F-ratio
Variance				
Among Means	2	242.39	121.19	
8.59 *				
Within Mens	90	1269.13	14.10	
TOTAL	**92**	**1511.52**		

** Significant at 0.05 level of confidence*

Table 4.5 shows that the obtained F-ratio (8.59) is significant at 0.05 level of confidence with 2/90 degrees of freedom as it exceeds the critical 'F'-value. This means that adolescent students belonging to high, average and low academic achievement groups differ significantly with regard to their cognitive style.

In order to find out the loci of differences in cognitive style of adolescent students belonging to various levels of academic achievement, 't' test was applied. The obtained statistics in this context has been presented in Table 4.6.

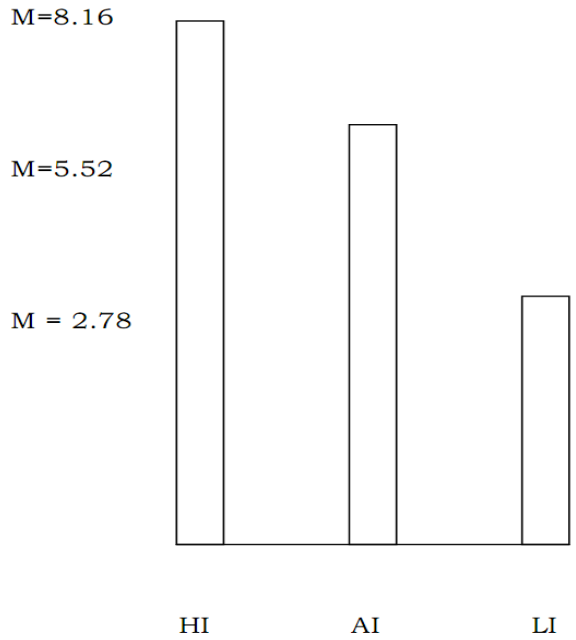
TABLE 2

Comparison of Means of Cognitive Style Scores of High, Average and Low Academic Achievement Groups

Group	N	Mean	S.D.	Comparison Groups	F-ratio
HAA	31	7.47	4.71	HAA - AAA	1.11 NS
AAA	31	6.35	3.00	HAA - LAA	3.59 **
LAA	31	4.03	2.50	AAA - LAA	3.30 **

*** Significant at 0.01 level of confidence*

FIGURE



Bar diagram showing means of cognitive style scores of adolescent students belonging to high, average and low academic achievements groups.

HI = High Intelligence

AI = Average Intelligence

LI = Low Intelligence

The 't' value (1.11) calculated for finding out the significance of difference in the mean scores of cognitive style of adolescent students of high and average achievement groups did not come out to be significant even at 0.05 level of significance. It implies that there is no significant difference in the cognitive style of high and low average achieving adolescent students. In other words, adolescent students belonging to both the groups do possess similar cognitive style. Table 4.6 further shows that there is significant difference in the cognitive style of high and low achieving adolescent students as the

obtained 't' value (3.59) came out to be significant at 0.01 level. It is also evident from the table that the mean value of cognitive style (7.47) of adolescent students belonging to high academic achievement group is higher than the mean value (4.03) of cognitive style scores of low academic achievement group. From this it may be inferred that high achieving students are more field independent than their counterpart low achieving students in their cognitive style.

The third 't' value (3.30) also came out to be significant at 0.01 level of confidence. It lead to the inference that average and low achieving adolescent students differ significantly from each other in their cognitive style. The mean difference with regard to cognitive style is in favour of average academic achievement group. Therefore, it may be stated that adolescent students belonging to average academic achievement group have more field independence than adolescent students of low academic achievement group.

A glance at the three means of cognitive style vis-a-vis three achievement groups shows the positive relationship between cognitive style and achievement scores of the adolescent students. The research hypothesis standing accepted.

The afore mentioned findings with regard to cognitive style and academic achievement are in consonance with a number of studies conducted in western countries as well as in India. For instance; Vaidya and Chansky (1980); Wilson (1981); Wolfe (1982); Randolf (1983); Grosnell (1983); Letschh (1984); Kelly (1985); Anderson (1986); Rupert (1987); and McCorkle (1987) found significant positive correlation between field independence cognitive style and academic achievement of the adolescent students. Further more; Murphy (1982); Chatterjea and Paul (1984); Harrison (1984); Banks (1985); Totle (1986); Hassan (1988) Stoeltji (1988); and Verma and Swain (1990) also noted significant difference in the academic achievement of field independent and field dependent students, confirming the positive significant relationship between academic achievement and field independence. One plausible explanation which can be offered in support of the findings pertains to the cognitive style of various academic achievement groups is that field independence and academic achievement-both are closely related with general intelligence.

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