

RESEARCH ARTICLE

COGNITIVE STYLES OF HIGH SCHOOL BIOLOGICAL SCIENCE TEACHERS

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ABSTRACT

The present investigation is directed at profiling of the cognitive styles of high school Biological Science teachers. It is based on data collected from 70 high school Biological Science teachers working in Kuppam and Gudupalli mandals of Chittoor district. Simple random sampling technique has been used to collect the sample. The Cognitive Style Inventory (CSI) has been used as tool to collect the data. Results indicate that the high school Biological Science teachers possess three types of cognitive styles, namely, split cognitive style, undifferentiated cognitive style and integrated cognitive style. It has also been found that there exists difference in cognitive styles of teachers based on variation in their gender and types of management of their schools.

Key Words: Cognitive Style, Systematic cognitive style, Intuitive cognitive style, Integrated cognitive style, Undifferentiated cognitive style, Split cognitive style, High school Biological Science Teacher.

INTRODUCTION

Cognition is a regular process in human lives. Cognition connotes 'knowing' and it is the basic process that helps human beings to conduct their lives. It is a process comprising perception, information processing, and the resultant output. Even though it is a universal process that occurs in human beings, however, it varies from person to person. Therefore, it is construed as ways of cognition and is psychologically known as 'cognitive style'. Perception is the first component process of the cognitive style. Perception takes place through senses. But there is a likelihood of its occurrence as a result of intuition also. The information processing takes place by means of perceptual matching with previous information available in the memory and subsequent judgement but before the appearance of the output or revelation through retrieval. Cornett (1983) described cognitive style as a predictable pattern of behaviour within a range of individual variability. Messick (1984) indicated that cognitive style deals with the manner in which people prefer to make sense out of their world by collecting, analyzing, evaluating, and interpreting data. Paivio (1971) indicated that cognitive style assesses whether an individual tends to think in verbal terms, using sequential processing of information, or in visual terms, using parallel processing. Srinivas Kumar (2011) defined that cognitive style has to be considered as a wholistic process of cognition that begins with the perception, and mediated by information processing, and the resultant retrieval; it varies from person to person and it is affected by various personality factors, such as, previous information, heredity and environment, interest, thinking, attitude, value system, intelligence, creativity, social and economic status and so on.

Objectives

Based on the focus of the problem, the objectives are framed as under.

- To find out the cognitive styles that exists among high school Biological Science teachers.
- To explore the kinds of cognitive styles that are available among high school Biological Science teachers due to variation in their age, gender, type of family, and types of management of their schools.
- In the subsequent step, the following hypotheses have been formulated in null-form.

Hypotheses of the study

- There may not be any significant difference in the types of cognitive styles among the high school Biological science teachers due to variation in their gender.
- There may not be any significant difference in the types of cognitive styles among the high school Biological science teachers due to variation in their age.
- There may not be any significant difference in the types of cognitive style among the high school Biological science teachers due to variation in their place of living.
- There may not be any significant difference in the types of cognitive style among the high school Biological science teachers due to variation in their type of management.
- There may not be any significant difference in the types of cognitive style among the high school Biological science teachers due to variation in their salary.

MATERIALS AND METHODS

Survey method has been used in the present investigation in order to analyse the cognitive styles that exist among Biological Science teachers and also to find out the levels of job satisfaction among them. A sample of 70 Biological Science teachers working in high schools located in Kuppam and Gudupalli mandals in Chittoor district of Andhra Pradesh State have been selected by means of the simple random sampling technique.

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The Cognitive Styles Inventory (CSI) has been used in this investigation for purpose of finding out the types of cognitive styles among high school Biological Science teachers. The CSI is standardized for Indian population by Praveen Kumar Jha (2001). It is a self-report inventory of the ways of thinking, judging, remembering, storing information, decision making, and believing in interpersonal relationships. The CSI comprises 40 statements from which 20 statements are related to Systematic Style and the other 20 statements to Intuitive Style and are to be responded on five-point scale running from ‘Strongly Agree’ to ‘Strongly Disagree’ with three middle responses of ‘Agree’, ‘Undecided’, and ‘Disagree’. It enables to assess the five styles, namely, *systematic style, intuitive style, integrated style, undifferentiated style, and split style*.

RESULTS AND DISCUSSION

On analyzing the data gathered from the said sample of high school Biological Science teachers, it has been found that a major portion of them possesses the Split Cognitive Style (30 out of 70 (42.86%)) followed by the Undifferentiated Cognitive Style (18 out of 70 (25.71%)), and the Integrated Cognitive Style (10 out of 70 (14.29%)). Interestingly, a minor chunk of them have Systematic Cognitive Style (7 out of 70 (9.99%)) and only a small portion of these teachers have been found to fall under Intuitive Cognitive Style category (4 out of 70 (5.71%)). Further, the following results have been obtained in respect of cognitive styles, namely, Systematic Style, Intuitive Style, Integrated Style, Un-differentiated Style, and Split Style, due to variation in gender, age, type of family, and types of management of their schools. Chi-square test has been used for testing the hypotheses set for the investigation.

The calculated Chi-square test value (2.235) is less than the table value (9.48) at 0.05 level and hence, the null-hypotheses accepted. There is no significant difference between cognitive styles among the high school Biological science teachers due to variation in their gender.

Hypotheses-2: There may not be any significant difference in the types of cognitive style among the high school Biological science teachers variation in their age.

The calculated Chi-square test value (1.63) is less than the table value (9.488) at 0.05 level and therefore, the null hypothesis is accepted. There is no significant difference between cognitive styles among the high school Biological science teachers due to variation in their age.

Hypotheses-3: There may not be any significant difference in the types of cognitive style among the high school Biological science teachers variation in their place of living.

The calculated chi-square value (3.82) is less than the table value (9.48) at 0.05 levels and as a result the null hypothesis accepted. There is no significant difference between cognitive styles of the high school Biological science teachers due to variation in their place of living.

Hypotheses-4: There may not be any significant difference in the types of cognitive styles among the high school Biological science teachers variation in their type of management

The calculated Chi-square test value (5.971) is less than the table value (9.488) at 0.05 level and as a result the null hypothesis accepted.

Table 1. Showing the chi-square test value for the cognitive styles among high school biological science teachers (N=70) due to variation in their gender

Gender	N	Systematic style	Intuitive style	Integrated style	Undifferentiated style	Split style	Chi-square test value
Male	35	4 (5)	2 (2)	03 (5)	9 (9)	16 (15)	2.235@
Female	35	3 (4)	2 (2)	7 (5)	9 (9)	14 (15)	

The table value is 9.49 at 0.05 level for df= 4 @ not significant

Table 2. Showing the chi-square test value for the cognitive styles among high school biological science teachers (N=70) due to variation in their age

Age	N	Systematic style	Intuitive style	Integrated style	Undifferentiated style	Split style	Chi-square test value
Upto 30 years	45	6 (5.14)	3 (2.57)	05 (6.4)	20 (19.28)	11 (11.57)	1.63@
Above 30 years	25	2 (2.85)	1 (1.42)	5 (3.57)	20 (10.71)	7 (6.42)	

The table value is 9.488 at 0.05 level for df = 4@ not significant

Table 3. Showing the chi-square test value for the cognitive styles among high school biological science teachers (N=70) due to variation in their place of living

Place of living	N	Systematic style	Intuitive style	Integrate Style	Undifferentiated style	Split style	Chi-square test value
Rural	5	7 (6.74)	4 (3.37)	08 (8.42)	13 (15.17)	27 (25.8)	3.82@
Urban	1	1 (1.25)	0 (0.62)	02 (1.57)	5 (2.85)	3 (4.71)	

The table value is 9.48 at 0.05 level for df = 4 @ not significant

Hypotheses-1: There may not be any significant difference in the types of cognitive style among the high school Biological science teachers due to variation in their gender.

There is no significant difference between cognitive styles among the high school Biological science teachers due to variation in their type of management.

Table 4. Showing the chi-square test value for the cognitive styles among high school biological science teachers (N=70) due to variation in their type of management of school

Type of management	N	Systematic style	Intuitive style	Integrated style	Undifferentiated style	Split style	Chi-square test value
Government	34	2 (3.88)	3 (1.94)	7 (4.85)	10 (8.74)	12 (14)	5.971@
Private	36	6 (4.11)	1 (2.05)	3 (5.14)	8 (9.25)	18 (15)	

Table 5. Showing the chi-square test value for the cognitive styles among high school biological science teachers (N=70) due to variation in their salary

Salary in rupees	N	Systematic Style	Intuitive style	Integrated style	Undifferentiated style	Split style	Chi-square test value
Upto 10,000/-	30	5 (3.42)	1 (1.71)	3 (4.28)	5 (7.71)	16 (12)	5.45@
Above 10,000/-	40	3 (4.57)	3 (2.28)	7 (5.71)	13 (10.2)	14 (17)	

The table value is 9.488 at 0.05 level for df = 4 @ not significant

Hypotheses-5: There may not be any significant difference in the types of cognitive style among the high school Biological science teachers variation in their salary.

The calculated Chi-square test value (5.45) is less than the table (9.488) at 0.05 levels. It indicates that the null hypothesis is accepted. There is no significant difference between cognitive styles among the high school Biological science teachers due to variation in their Salary.

Conclusion

The present investigation gave interesting results. It has been revealed that the biological science teachers working in high schools possess three cognitive styles in a major way, namely, Split Cognitive Style (30 out of 70 (42.86%)) followed by the Undifferentiated Cognitive Style (18 out of 70 (25.71%)), and the Integrated Cognitive Style (10 out of 70 (14.29%)). It is dramatic that a very minor chunk of them appears to possess systematic and intuitive styles. Conceptually, split cognitive style is a combination of intuitive and systematic style. This characteristic feature points towards their ability to perceive and operate in a context-based manner either systematic or intuitive. The second large segment of sample of biological science teachers have been found to fall under the category of undifferentiated cognitive style that which is an unusual dimension among them. Because a person with such style appears not to distinguish or differentiate between the two style extremes, that is, systematic and intuitive, and therefore, appears not to display a style. In a problem-solving situation, he/she looks for instructions or guidelines from outside sources. Undifferentiated individuals tend to be withdrawn, passive and reflective and often look to others for problem-solving strategies. Probably, such a result appeared because of some other significant factors like their thought processes, interests, value-system, attitudes, social and economic statuses,

inhibitions etc., that which have a bearing on the cognitive style of an individual. Results further indicate that the third major portion of high school biological science teachers possess the integrated cognitive style. It is indicative of their ability to change the styles very rapidly between systematic and intuitive and to use them in an integrated manner as is required in a situation. It is also an indicator of their problem-seeking and problem-solving ability. The remaining minor portion of biological science teachers is seen to possess two cognitive styles, that is, systematic, and intuitive which is again unusual. However, both these aspects need further investigation to corroborate the present results. Finally, it is interesting to note that all hypotheses set in null form in the investigation have been accepted and it indicates that there is no influence of gender, age, place of living, type of management of school, and salary in respect of existence of particular types of cognitive styles in biological science teachers. Even these aspects need further research to support the current findings.

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