

Exploring the Relationship between Cognitive Style and Learning Style with Academic Achievement of Elementary School Learners

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ABSTRACT

Learning at elementary classes is a crucial time as it lays a foundation for future learning. Yet, the universal achievement is still a far reached goal. Although many variables have been identified that hinders the low achievement among learners at this stage. In an attempt to explore how learning styles and cognitive styles affect the learning and nature of relationship these styles have with the achievement of learners. The data from the research indicates that there is a link between cognitive style and learning style which also determines the achievement of learners. The results from the data indicate that the learners having field dependents and field independents (cognitive style) have different learning styles. Since, the learners differs in their cognitive style, therefore if an attempt is made to identify them will improve the learning. It is also argued that by supplementing the curriculum transaction with the awareness of cognitive and learning styles, the teachers can help their learners to reach the desired learning levels.

Keywords: Learning, elementary classes, learners, cognitive style, curriculum transaction, learning styles, data

The progress of the nation depends upon the intellectual capacity of its citizens. Therefore, it is necessary to identify the talents in our children and to provide them suitable opportunities, which will enable them to develop their potentialities in the direction of higher achievement.

Each child is unique in terms of his inherent nature, needs and inborn potentialities. According to Jordan (1973), "How to learn" is also by itself something that has to be internalized though it is rarely taught in the school. A teacher needs to understand the process of individual learning. In the process interaction individuals are interacting with the environment i.e., uniquely processing the information and require a unique environment for learning. So, the relative issue of facilitating conditions to help individuals to optimize their learning should be taken into consideration while organizing such interactions.

Learning is a primarily cognitive activity; it is likely to be influenced by the styles of learners which they choose while they learn. Descriptions of cognitive style, notes McFadden, include: a consistent pattern of behavior within a range of individual variability (Cornet, 1983); a student's consistent way of responding to and using stimuli in a learning environment (Claxton & Ralston, 1978); how individuals process information and prefer to learn (Garity, 1985); the way individuals organize information and experiences (Laschinger & Boss, 1984); a person's characteristic style of acquiring and using information (Haynsake, 1981) and; an expression of psychological differentiation within characteristic modes of information processing (Witkin & Goodenough, 1971, 1981).

A cognitive style is one of the dimensions in which an individual differs. It is conceptualized as information processing habits that develop in harmony with

underlying personality characteristics. Cognitive style appear in a form of stable preferences, attitudes or habitual strategies which categorize a person's mode of perceiving, remembering, thinking and problem solving. Learning style is a powerful offshoot of cognitive style. Learning style is defined as the ways that students personal characteristics, including their needs and preferences, Dunn says learning styles consist of "a combination of physical, physiological, emotional and widespread elements which affects the ways individual receive, store and use knowledge or ability".

Thelen (1954) was the first to use the term learning style. Learning style researches have conceptualized and defined learning style in number of ways some viewed it as bi-dimensional concept (Witkin, 1959; Kogan 1963) while others perceived it as a multidimensional concept (Dunn and Dunn, 1978; keefe, 1979). Schmeck (1977) defined learning style as a predisposition on the part of learner to adopt a particular strategy regardless of specific demands of learning tasks, Schmeck defines learning strategy as r pattern information processing on continuum, one extreme being shallow Vs repetitive processing and other deep Vs elaborate processing, shallow processors tend to remember symbol used in communication and elaborate processors do more than just remembering; they classify, analyze and synthesize information.

Although there has been a lot work has been done in this area, little attention has been afforded to the interaction between cognitive styles and learning styles. The most pressing need is to learn more about the learning styles of students from various cultural backgrounds. Changing demographics portend an even more diverse student body in the future and instruments that take cultural differences into account need to be developed. Research is needed to illuminate the connections and interaction between style, developmental stage, disciplinary perspectives, and epistemology. A better understanding of the link between them would provide a helpful framework for examining teaching methodologies, the role of learning in individual development, and the use of the disciplines to promote more complex and integrative thinking.

Although, Piaget has taken a rigid stand that child passes through all stages of intellectual development on the other hand social psychologists have given

contradictory remarks by saying that the child can skip the stage and go on to the next stage if the environment is stimulating. If the learners are taught through instructional methods or resources in those conditions of learning that complement their styles; then they can master the identical information or skills, this helps in optimizing learning and achievement.

The present study has tried find whether there is any relationship that exists between cognitive dimensions and student's characteristic learning styles in terms of environmental, emotional, sociological, and physiological stimuli and also how they both affect the academic achievement. This present study will reveal the emotional, sociological, physical and environmental needs of learning of field independence and field dependent.

Objectives of the Study

1. To identify the cognitive styles of the learners.
2. To identify the learning styles of field independent learners.
3. To identify the learning styles of field dependent learners.
4. To find the relationship between learning styles and cognitive styles with respect to academic achievement.

Hypotheses

1. There is no significant relationship between learning styles and cognitive styles of field independent with respect to academic achievement.
2. There is no significant relationship between learning styles and cognitive styles of field dependent with respect to academic achievement.

Methodology of the Study

(A) Population: The population included elementary school learners from VIIIth standard from public schools of Delhi. The learners from this class were chosen because this stage is the onset of adolescence, the desire to become independent become stronger at this stage. Researches have shown that as the age progresses the learning style and cognitive style of the child also changes with coming in contact with

the various influences in their life at this age. Beyond this stage, the cognitive style begins to concretize and also at this age, learners are continuously working towards acquiring a particular cognitive and learning style.

B) Sample: Selection of the sample involved a two stage sampling procedure.

Stage I: Selection of the Classes

The learners of each section of standard VIII were selected for the study.

Stage II: Identification of Field Independent and Field Dependent

Learners studying in standard VIII were the respondents of the study. After the selection of the class, the Group Embedded Figure Test (GEFT) had been administered to the students of each section of standard VIII for the selection of the sample.

To make individual *raw scores* on GEFT comparable, they have been converted to *Z-score* and distributed on a *stanine scale*. The stanine scale is an 'equal area' conversion in relation to Z-scores that run 1-9 along the baseline of a normal probability curve constituting a scale in which each unit is 0.05. Field independents Z- scores varied between 1.25 to 1.75 and above have been placed in stanines 7-9 where as Field dependent scored between -1.25 to 1.75 and below and have been placed in stanines 1-3. The final sample of 160 (80 field independents and 80 field dependents) have been selected after taking 35% from each group of field independents and field dependents of each class.

Description of the tools of the research

(A) Two learning styles inventories for Assessing learning style

(i) Learner's responses developed by Dunn, Dunn and Price. The LSI consists of 100 statements that are categorized as aspects and elements. There are total Twenty two elements which have been classified under four aspects: (i) Environmental (ii) Emotional (iii) Sociological (iv) Physical. The coefficient of correlation ranged between 0.60 -0.80 for 18 elements.

(ii) Teacher's perceptions of learning style preferences of the learners developed by Judy W. Wood

(1990). The inventory is a checklist comprising 36 statements that seek teacher's responses in 'True' or 'False' form for each statement. The learning style inventory intends to assess learner's approach to new learning situations, overall learning styles and learning modalities of the learners. Learner's Approach to New Learning Situation: Learners are categorized as adventures, ponderers and drifters on the basis of learning characteristics for the approach to new learning situation.

Overall Learning Style: This aspect of the learning style inventory yields information on learners being independent, collaborative or dependent. Learning modalities: Three perceptual modalities have been identified by the author of LSI and are referred as perceptual styles. Visual, Auditory and Tactile – Kinesthetic.

(B) For assessing the cognitive ability of the learners, the Group embedded Figure Test was used. The reliability estimate of 0.80 for both males and females was found by the Spearman -Brown prophecy.

RESULTS AND DISCUSSION

Learner's perception on their learning styles

Group profiles of learning style preferences of field independents and field dependents show differences in the responses if their percentage frequencies on the leaning style inventory. The learning style preferences of field independents and field dependents have been interpreted under three subheadings: physico-environmental social-emotional and perceptual preferences.

(a) Physical-Environmental Preferences

Stimuli reflecting degree, intensity or quality of noise level intensity or quality of light, temperature variations and furniture design or seating arrangement constitutes learning environment around learner. Need of intake and/or mobility and time of the day indicate the physiological implications of learners. Interpretation of physico-environmental preferences of learners intends to provide information to the individual learner and his/her parents for creating flexible environment for learning. Field independent's preference for noise level indicates that they can ignore background sound like conversation, radio, and television much

better than field dependents. This implies field independents can concentrate better with noise in their surroundings; perhaps noise prevents the feeling of loneliness.

The present study indicated a difference between field independents and field dependents as regards their preferences for light and temperature while learning. Findings have also indicated that high percentage of field dependents over field independents differs in their preferences to seating design. Investigators have indicated that field independents prefer formal or conventional classroom furniture where as field dependent preferred informal environment i.e. sitting on floor, carpet, rug, bed etc. This contributes to their persistence level. Therefore, for studying at home parents need to be provided information regarding the seating design need for their ward. It may have a financial implications or space problems both schools and at home.

Field independents prefer to learn more without frequently need of intake of food, whereas field dependents prefer to take food while learning. The need for intake supplements energy expended or relaxes tension experienced. Field dependent preferences for intake may be due to the reason that learning is a stressful experience for them. Intake may be a distraction for them resulting low level of persistence, elements to reduce anxiety level.

The study revealed that field independents need for mobility than dependents. The field independents revealed low preference for intake and more preference for mobility over field dependents. This implies field independents look for an activity involving whole body or kinesthetic experiences. These experiences may help them to learn better.

Field independents revealed more preference for morning over field dependents. Morning seem to be an indicative of preference for bright light motivation, responsibility, mobility or activity. On the other hand field dependents have indicated the preference for late mornings. Thus, matching time preferences for field dependent and field independents is important for learning.

(b) Socio-emotional preferences

Motivation (internal and external), persistence in studying, responsibility towards academic learning

and need for structure or freedom to experience reflects emotionality or learner's. Social affiliation for peers, adults (parents and teachers) or in combination creates a learning environment to achieve. Information regarding socio-emotional preferences seems to serve as useful-indicators for providing classroom and home environment.

Field independents show self-motivation more than field dependent this means they are internally motivated. Field independents are not peer-oriented as their other classmates which imply that. They prefer to work alone. The field independents do not prefer parent figure motivation and have a low preference for teacher figure motivation over field dependents, which implies that field independents are more responsible learner with high preference for motivation implies that it may be probable effect of preference for the want of adult motivation or as a direction for work since they are less responsible.

Field independents revealed higher persistence level than field dependent while learning. It indicates greater possibility of high achievers completing their assignment; it helps them to complete their task given to them Field independents being more persistent shoulder responsibility or their own learning and complete their task to their best of their ability with little guidance as they have a longer attention span. On the other hand, the field dependent has low preference for persistence implying higher level of motivation.

Field independents have shown higher responsibility as compared to field dependent. Thus, motivation persistence and responsibility are interlined with each other. The field dependent are less persistent, coupled with low sense of responsibility and need continuous direction or supervision by teachers.

Need for structure have shown much difference regarding their preference. The field dependent's need more structured situation than field independents Teachers have a necessary implication for providing structured situations and proper guidelines for field dependent.

None of the field independents have shown preference for the presence of authority figure corroborating the findings suggesting lesser preference for extrinsic motivation and higher self-motivation. While the field dependent have shown preference for the presence of authority figure indicating that field

dependent prefers to learn with authority figure, desperately need a teacher or a responsible adult who provide structure, control, encouragement and correct directional instructional material.

Marked differences have been shown in the higher preferences of learning in varied ways among field independents than field dependent. It highlights the need for the need variety of activity for learning.

(c) Perceptual preferences

The field independents has shown higher preferences for auditory and visual style over field dependent indicating that they can understand the verbal instructions much better than field dependent.

None, of the field dependent have chosen kinesthetic and tactile learning modality. It implies that field dependent prefers passivity; field independents need involvement on many energetic activities dynamically. Perceptual modality is an important factor for learning and an individual's way of perceiving stimuli, processing information, acquiring knowledge and responding to the learning environment. Hence, there is a need to develop activities and resources for tactile-kinesthetic in addition to auditory visual mode of learning. Insight into perceptual preferences of learners intends to set guidelines for complementary methodology, material resources and multi-sensory packages for effective instructions.

Learning Style Preferences Profile from Teacher's Perception

Teacher's assessment of learning style preferences of their students is relevant to understand whether teacher knows the LS of their students, identified as field independents and field dependents. Three-way categorization of the LSI by Judy W. Wood is intended to assess learning style preferences of learners on the entire three aspects i.e. learner's approach to new learning situation, overall learning style and learning modalities.

To eliminate chance of teacher's prejudice ignorance of learning style preference of learners, observations of three teachers teaching three different subjects (Maths, Science and Social Studies) to the same students have been sought on LSI for teachers. The teachers have been asked to indicate whether each observation held 'true' or 'false' for that learner

by means of a tick mark in the given column. The inventory is accompanied with on aspect wise recording sheet.

The category with maximum tick marks indicates the student's learning style; a student may exhibit a combination of styles. The scores have been analyzed as cumulative opinion of teachers on the inventory. Percentage analysis has been used to study teacher's perception of learners. The category indicating maximum score shows the most preferred and that with minimum score the least preferred in the order of learning style preferences of learners.

(a) Profile of Learning Style Preferences of Field Independents

Field independents have ability to cope with noise .with conventional seating arrangements; prefer morning to learn. They need mobility but like eating after finishing studying. They are motivated, persistent and responsible learners. As regards learner's approach to new learning situations, teachers identified field independents as adventurers who have to analyse the situation and respond in a reflective manner. Preferences for visual and kinesthetic learning indicate their ability to observe and probe in to learning situations. The overall learning styles of field independents have been identified as independent seem to have ability to modify and make use of appropriate approaches towards learning as and when required.

This may result by striking the balance between the emotional needs of extrinsic and intrinsic motivation. It also implies that they do not follow the same rules but always look for new ways to deal with the problems.

High level of persistence and owing responsibility of their learning independently. All these characteristics clustered together to help field independents in learning. The independents function better in an instructional environment that provided options or alternatives for understanding concepts and acquiring knowledge.

Field independents are perceptually strong. It seems field independent have the ability to use the auditory, visual and tactile-kinesthetic modalities to learn better. Hence, environment distraction of sound and noise do not affect their learning.

(b) Profile of Learning Style of Field Dependent

Field dependent, prefer quite and causal seating arrangements and late morning for learning; they need to eat something when they are studying. They are less motivated, less persistent and less responsible; are peer-oriented and need the presence of authority figure; also requires parent and teacher motivation. Teachers perceived them as drifters with regards to new learning situations. They have a lower self-motivation. Their inability to complete their assignment suggest their shorter span of attention while learning, dislike for noise in the learning environment is also a cause for their short attention span.

Field dependents are dependents in their overall learning style indicating the need for social affiliation for to learn. Peer-orientation of field dependent suggests their inability to work alone and need for group strategies for learning. They show preference for adult and figure motivation. Need for structure seems to be related to working with authoritative adults, direction and frequent reinforcement for continued performance either from peers from adults suggests their dependent overall learning style.

Teachers have perceived as tactile-kinesthetic learner as field independents and field dependent may have combination of approaches to be used in learning situation.

Relationship Between Learning style and cognitive style with academic achievement

Since the correlation coefficient has between the academic achievement and the field independents was found to be 0.687. Therefore, it can be concluded that the field independent students can show the better performance. When the co relational analysis was carried out between the academic achievement of the field dependent students, it was found that the value of the correlation coefficient was found to be positive but it was not significant.

After analysis, the correlational coefficient was found to be positive for both the groups but found to be significant only for the field independents. This implies even if the groups (field independents and field dependent) perceives the subjects differently and adopt nearly contrasting learning style, there

is a slight difference which comes in the academic achievement. But still to enhance learner and to make the understanding optimum, the learning conditions should be provided to the learners.

CONCLUSION

The quality of the inputs determines the quality of human resources of the nation. The students are the inputs of the educational process and teachers need to face the challenge of individual differences amongst the learners.

Meaningful diagnosis of learning style preferences amongst the field independents and field dependents; a careful implementation and compatible treatments would prove functionality of an individual learning. Application of learning style in classrooms would be an effective tool for effective instruction. It will also help in institutional planning. It also helps in making the learners to become ponderers, collaborative and independent in learning.

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