

LEARNING STYLE PREFERENCES AMONG ADOLESCENT STUDENTS

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ABSTRACT: *In 21st century, education sector has been focusing on a change that is no less than a paradigm shift. This change can be visualized through various models that signify the importance of individuality among adolescents in terms of learning styles. This paper discusses about various learning style models i.e. Grasha-Riechmann Learning Style Model, David Kolb's Experiential Learning Model, Gregorc learning style model, Dunn and Dunn learning style model, Felder-Silverman learning style model, Peter Honey and Alan Mumford's Model, RASI Model, Barsch's Model, The 4MAT Model, Neil Fleming's Vark Model. All of the above learning style models have been compared on the basis of learning style modes or dimensions. It recommends selection of suitable learning style model under several conditions.*

Key Words: *learning style, learning style models, adolescents*

INTRODUCTION

In the last decade, a remarkable change could be seen in the education sector. The emphasis has been given to make learning process more easier, highly customized and learner oriented. An effective teaching-learning styles that have been used for the both faculty members and adolescent students witnessed paradigm shift. In 21st Century, the concept of individuality gained importance both in social milieu as well as in the education sector. Reiff (1992) found that almost all learners have individual attributes relating to their learning processes. Every adolescent is unique and should be taught according to his/her style of learning. Briggs (2000) put focus on the consideration of student's individual learning style in an effective teaching-learning process. The research on student learning techniques have been entered a new phase. It is the phase of demarcating new ideas and theories that complement students learning capabilities. No doubt, researchers in last decade has been burning midnight oil to expound different learning styles according to either teacher academic curriculum setup or student learning techniques. The research that was quantitative in nature in relation to number of theories that put forward now fortunately converge on a pedagogical issue. This issue is all about student learning capabilities or learning style preferences (Hawk & Shah, 2007).

It is seen that every teacher teaches according to his or her comfort zone and compatibility etc. with different teaching styles while ignoring the need of his students. Stitt-Gohdes (2001) also holds that most teachers teach the way they have already learned. The result of this mistaken belief raised an issue at the front that must be acted upon. In today's world, teacher should focus on learning styles than ever before (Buch & Bartley, 2002). Various institutions have been engaged in pursuing the required methodology that should be used in classroom so as to develop different learning styles for the students.

As every child is a unique one. Uniqueness lies in his ability to comprehend or grasp certain new things that seems impossible for others. Learning starts at birth of a child. And this process is never ending. It is a continuous process right from birth to death. Every child has their own style of learning to acquire new information. A same opinion that learner's vary greatly in their style of learning was even supported by (McCarthy, 1990). The learning styles are basically a preferred way of acquiring new information. Many researchers defined learning style in different ways.

Dunn & Dunn (1993) describes learning style as a process of concentration, absorb innovative and difficult information and retain is called learning style. Learning styles are a reliable way of operating and reproduces the primary causes of learning behaviour (Keefe, 1987). A child either possess one unique/dominant style of learning which give edge to the child over others or has a combination of more than one style of learning. It does not matter whether a child has a dominant style or a combination of more than one learning style as far as the result of his efforts bear fruit. There are various styles of learning i.e. visual, auditory, kinesthetic etc. Some children grasp information more easily by seeing i.e. through images, charts

etc., while others consider hearing as a best medium to gain new information. And some prefer hands-on experience as a good technique to enrich their knowledge (Zapalska & Brozik, 2006).

Related-Literature

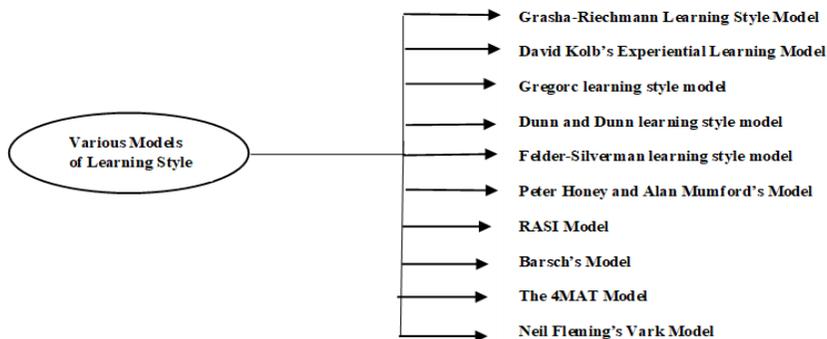
In order to create interest among students, teacher must have knowledge about different learning styles and adapt similar teaching methodologies that best fit each of his student. Learning style of each student should match with the teaching methodology of a teacher. It also enhances academic performance of students. Many researchers supported this idea in their studies. A teacher who has knowledge about student’s diverse learning styles make similar choices in their teaching methodologies (Abdelhadi, 2017; Hawk, Thomas F; Shah, 2007; Nielsen, 2008; Yousef, 2016b). To achieve better educational outcomes, a teacher should ensure that the teaching strategies should match with the learning styles of students, was reported by (Charkins, O’Toole & Wetzel, 1985; Fatt, 2000; Fleming, 2001; Park, 2001; Yousef, 2016a). Felder (1993) found that students retain information for more longer time when there is a match between teaching style and learning style. Poor performance due to a mismatch between learning style and teaching style, is also reported by (Felder & Silverman, 1988; Smith & Renzulli, 1984; Vreken, 2006). These studies done by various researchers suggest faculty members to improve their teaching methodologies so that it should match with learning style in order to increase academic performance.

There are various teaching methods such as lecture method, lecture cum demonstration method, project method, heuristic method, inductive-deductive approach etc. So, teacher should make use of these methods in order to satisfy learning style of each student. Many researchers supported previous studies that mentioned about the use of various teaching methods in order to satisfy variability of students’ learning styles within educational programs (French, Cosgriff, & Brown, 2007). Even teacher should be so trained that he can able to identify numerous learning style pattern of their students so that he can easily mould his teaching style to make teaching learning process more effective. But many researchers opposed this view. There is no need to alter any teaching methodology that best fit learning style of each student. As learner can easily adapt to any teaching style (Prajapati, Dunne, Bartlett, & Cubbidge, 2011). There would be no enhancement in academic performance by matching teaching style and student’s learning style preferences(She, 2005).

Many researchers also identified that learning style preferences are dependent on various factors like gender, residential area, culture, school environment, age etc.

Females expressed more preference towards reflective and visual learning style than males (Prajapati et al., 2011). Similarly, Park (2001) revealed significant sex differences among student’s learning style preferences as well as achievement level differences. Another study also examined differences in learning styles based on gender i.e. male medical students show more preference for visual learning styles over verbal learning styles as compared to females (Hernández-Torrano, Ali, & Chan, 2017). Researchers (Boland, Sugahara, Opdecam, & Everaert, 2011) revealed that there exist relationship between cultural factors and learning style preferences. They found that Japanese students prefer the visual learning style due to their collective traits as compared to the other two student groups from Australia and Belgium, who tend to be more individualistic and prefer to learn through kinesthetic learning style. Laxman Singh et al. (2015) examined that there exists no significant impact of certain demographic variables like gender, place of living, religion and educational level of father on the learning style preferences of secondary school students. But they noted significant impact of mothers’ educational level on the learning style preferences of the students.

Various Models of Learning Style are briefly explained below.



Grasha-Riechmann Learning Style Model (1974)

According to this model, the major learning styles are *avoidant, participative, competitive, collaborative, dependent and independent*.

Avoidant prefer to avoid attending class. They don't show their interest and participation in the class. Basically, they are passive learner. Participative prefer to involve more in class. They are active learners. Competitive prefer to compete with whole class in order to achieve success. Collaborative prefer to learn in collaboration with teacher and other students. Dependent prefer to learn by relying on others. They treat teacher and peers as their support. Independent prefer to work on their own. They follow self-paced instructions.

David Kolb's Experiential Learning Model (1984)

Kolb gave 4-mode learning cycle. It starts from Concrete Experience (CE), moving towards Reflective Observation (RO), then towards abstract conceptualization (AC), and last reach towards active experimentation (AE). According to this model, learning styles are a combination of two adjacent modes. So, four basic learning styles are *Diverger, Assimilator, Converger And Accommodator*.

Diverger: They are more creative and imaginative. They are more insightful to find out a reason behind a problem. Lecture method, hands on exploration and detailed as well as systematic information etc. are more suited to them. So, teacher should be more interactive to deal these students and answer their queries.

Assimilator: They deal with abstract ideas and follow inductive reasoning. They are against random search. Lecture method (audio/ video, ppts) followed by demonstration and lab work followed by prepared tutorial are instructional materials that suits them. As they don't like more interference of a teacher, so they follow prepared exercises.

Converger: They are more practical oriented and follow deductive reasoning. CAI-based instructions, interactive sessions, problem sets, workbooks etc. are suited to them.

Accommodator: They are risk takers, independent discoverers and active participants. Project method, heuristic method, field work etc. are some instructional methods meant for them.

Gregorc learning style model (1985)

According to this model, there are four styles of learning- *concrete-sequential (CS), Abstract-Sequential (AS), Abstract-Random (AR) and Concrete-Random (CR)*.

The CS learners prefer hands on experience. They are time lined, move step by step in a proper order and more result oriented. The AS learners are strongly analytical, logical and evaluative. They favour verbal form of instructions. They are not time line oriented because they are more over focussed on their work. They have lot of solutions for a single problem. The CR learners are risk takers, learn by trial and error, use creative and original problem-solving skills. They learn in unstructured environment, want independence and to invent new ideas. The AR learners prefer visual preferences for taking in new information. They learn holistically in unstructured environment. They prefer discussions, conversations and want time to reflect on experiences. They personally involve in learning process.

Dunn and Dunn learning style model (1985)

This model comprises of five learning style stimuli and each stimuli contains several elements within it. These elements are basically child's preferences. The five stimuli are

Environmental stimuli: In this stimuli, child's preferences for sound, light, temperature and seating arrangement are to be considered.

Emotional stimuli: In this stimuli, child's level of motivation, persistence, responsibility and structure are to be considered.

Sociological stimuli: In this stimuli, child's preferences for doing things in pairs / groups, alone, teamwork, with a teacher or under numerous social settings are to be considered.

Physiological stimuli: In this stimuli, we consider our child's preferences for different modes of learning like visual, auditory, kinesthetic and read-write. We also look at his method of taking in new information, time-of-day energy levels, and the need for intake (food and drink) and mobility while learning.

Psychological stimuli: In this stimuli, we consider child's style of learning preferences whether he comes under analytic/global thinker style or impulsive/ reflective thinker style.

Felder-Silverman learning style model (1988)

According to this model, the different styles of learning are *Active/reflective, sensing/intuitive, visual/verbal, sequential/global*.

Active learners prefer to work in group. Reflective learners prefer to do things on their own and need some time to think before doing any task. Sensing learners prefer to learn by connecting with real world. They like to learn from facts, data and practical information. Intuiting learners prefer to learn from original and

abstract information. They like discovering new possibilities. Verbal learners prefer to learn by using a sense of hearing. Activities like debate, discussion, music, audio tapes, video plus audio etc. are suitable for them. Visual learners prefer to learn by seeing things. Activities like pictures, charts, maps, graphs, different colors etc. are suitable for them. Sequential learners prefer to learn by moving step-by- step, in logical manner to sort out a problem. Global learners prefer to learn intuitively by working in random manner without seeing any connections and finally arrive at a correct conclusion.

Peter Honey and Alan Mumford’s Model (1992)

The concept of this model was adapted from Kolb’s experiential learning style model. According to this model, the four modes of learning styles are *Activist, Reflector, Theorist and Pragmatist*. Activist prefer learning by doing method and group work. They get involved in new experiences, problems and are open-minded. Reflector prefer to do things on their own and need some time to think before doing any task. Theorist prefer to learn in structured environment. They are analytical in thinking and use their ideas to understand a theory behind the actions. Pragmatist are practical oriented. They prefer to find out new ways and try out in practice. They are good in making practical decisions and solving problems.

The Revised Approaches To Studying Inventory (RASI) Model (1995)

This model identifies that learners prefer one of the learning styles over the others. The styles of learning are *Deep, Surface, Strategic*. In Deep learning style, child is active learner and critical thinker. He has good logical thinking and reasoning ability. He tries to make link between previous knowledge and new knowledge in order to understand it. In surface learning style, child prefer rote memorization. He is passive learner and unable to apply reasoning power, logical thinking, critical thinking to solve any problem. In strategic learning style, child prefer to excel in his stream. He knows about the importance of time management and organize his studying routines in same order.

Barsch’s Model (1996)

This model was given by Jeffrey Barsch. It is applicable for high school or college level students that informally evaluate each learning style preferences. In this model, the styles of learning are *auditory, visual and tactile/kinesthetic*. Even this model is useful for identifying learning styles of learning-disabled students.

The 4MAT Model (1997)

This model was given byBernice McCarthy. According to this model, the four major learning styles are *imaginative, analytic, common sense, and dynamic*. Imaginative learners prefer to learn through personal interactions and sharing of ideas. They get involved in new experiences and try to work on their own. *Analytic learners* prefer to learn in structured situation, solve their problem in logical and analytical way. They rely on fact-based information. *Common sense learners* prefer to learn by doing. They involve in active participation to solve a problem and to seek out useful results. *Dynamic learners* prefer to learn in unstructured environment. They are more risk-takers, independent discoverer, self-directed discoverer and challenges tackler.

Neil Fleming’s Vark Model (2001)

In this model, the four styles of learning are *Visual, Aural, Read-Write and Kinesthetic*. Visual learners prefer to learn by seeing things. Activities like pictures, charts, maps, graphs, different colors etc. are suitable for them. Aural learners prefer to learn by using a sense of hearing. Activities like debate, discussion, music, audio tapes, video plus audio etc. are suitable for them. Read-write learners prefer to learn by reading the information and then writing it down. Activities like taking notes, books or textbooks, handouts, written feedback, multiple choice, essays, web pages, reports, readings, manuals etc. are suitable for them. Kinesthetic learners prefer to learn by carrying out some activities. Activities like field trips, working models, guest lecturers, real life examples, demonstrations, role play, physical activity or hand-on approach, collection of samples etc. are more suitable to them.

From the above, Table A provides information about various learning style preferences or dimensions of different learning style models.

Table-A: Dimensions of different learning style models

MODEL	DIMENSIONS
<i>Grasha-Riechmann</i>	Avoidant,Participative,Competitive,Collaborative,Dependent,Independent
<i>Kolb</i>	Accommodator, Assimilator, Converger, Diverger
<i>Gregorc</i>	Concrete-Sequential (CS), Abstract-Sequential (AS), Abstract-Random (AR) And Concrete-Random (CR).
<i>Dunn & Dunn</i>	Impulsive,Teamwork,Pair/Peers,Self,Reflective,Global,Analytic, Aural,Visual,Read/Write,Kinesthetic,Roomdesign,Sound,Light,Temperature, Motivation, Persistence, Responsibility

Felder-Silverman	Active/Reflective, Sensing/Intuitive, Global/Sequential, Verbal/Visual
Honey-Mumford	Activist, Pragmatist, Reflector, Theorist
RASI	Surface, Deep, Strategic
BARSH	Auditory, Visual, Kinesthetic
4MAT	Imaginative, Analytic, Common Sense, And Dynamic
VARK	Visual, Aural, Read-Write and Kinesthetic

As from the above table A, various models of learning style show similarities or dissimilarities among their learning style dimensions. In similar sense, (Coffield et al., 2004a) classified learning style models into five families based on fundamental overarching concepts. The first family relates to the concept that learning styles and preferences are largely constitutionally based, including the four modalities: visual, auditory, kinesthetic, and tactile (VAKT). The second family category relates to the concept that learning styles reflect deep-seated features of the cognitive structure, including patterns of abilities. The third considers the learning styles as one component of a relatively stable personality type. The fourth family relates to the concept that learning styles are flexibly stable learning preferences. The last category moves on from learning styles to learning approaches, strategies, orientations, and conceptions of learning. Similarly, in this paper various models of learning styles as explained above has been classified into only three families. (By following Coffield’s pattern of families classification)

Table B reports the three families of learning styles covering various models of learning style.

Table B:Families of learning styles by coffield et al.

1) Flexibly stable learning preferences	2) Sensory based	3) Learning approaches & strategies
<ul style="list-style-type: none"> • Kolb • Honey-Mumford • 4MAT • Felder-Silverman 	<ul style="list-style-type: none"> • Dunn & Dunn • VARK • BARSH • Gregorc 	<ul style="list-style-type: none"> • RASI • Grasha-Riechmann

Analysis:

- On the basis of families of learning style as given by Coffield et al., the three models of learning style (i.e. Kolb, 4MAT and Honey-Mumford) which belongs to family 1 (i.e. flexibly stable learning preferences) are compared with each other. Table C represents a comparison of the three models of learning style.

Table C: Common learning style preferences among kolb, honey-mumford, 4mat model

Common Learning Style Preferences Among Kolb, Honey-Mumford, 4MAT Model	
Accommodator/Activist/Common-sense <i>(feel and do)</i>	Diverger/Reflector/Imaginative <i>(feel and watch)</i>
Assimilator/Theorist/Analytic <i>(think and watch)</i>	Converger/Pragmatist/Dynamic <i>(think and do)</i>

On comparison of different learning style models, it was found that Honey and Mumford model was being derived from Kolb’s learning style model. Similarly, Mc Carthy’s (the 4MAT model) was too based on the work of David Kolb model.

- A concept of Felder-Silverman learning style model is represented by four dimensions. The two dimensions i.e. active/reflective and sensing/intuitive are influenced by Kolb’s theory and two other dimensions i.e. verbal/visual and global/sequential are added. So, according to Felder-Silverman’s model, a learner rather prefers one certain modality of each dimension. (Kaliská, 2013)
- Gregorc learning style model which belongs to family 2 (i.e. sensory based) is a model that uses perceptual and thinking/ processing modes to determine four preferred learning styles. It is a modified version of Kolb’s learning dimensions, focusing on random and sequential processing of

information.

Table D represents common learning style preferences among Kolb, 4MAT, Gregorc, Honey-Mumford Model.

Table D: Common learning style preferences among kolb, 4mat, gregorc, honey-mumford model

Common Learning Style Preferences Among Kolb, 4MAT, Gregorc, Honey-Mumford Model			
<i>KOLB</i>	<i>4MAT</i>	<i>GREGORC</i>	<i>HONEY-MUMFORD</i>
converger	dynamic	concrete-random	pragmatist
assimilator	analytic	abstract-sequential	theorist
accommodator	common-sense	concrete-sequential	activist
diverger	imaginative	abstract-random	reflector

- VARK and BARSCH learning style models share similar three learning style preferences i.e. auditory, visual and kinesthetic with each other; except one learning style preference i.e. read/write that is only present in VARK learning style model. Even, Dunn & Dunn learning style model contains these four learning style preferences within it. Moreover, Dunn & Dunn model is an only one that contains room design, sound, light, temperature, motivation, persistence and responsibility elements. The four dimensions i.e. impulsive, reflective, global and analytic of Dunn & Dunn model shares common characteristics with four dimensions of Felder-Silverman model i.e. active, reflective, global and intuitive respectively.
- RASI learning style approach share surface, deep and strategic dimensions with avoidant, participative and competitive dimensions of Grasha-Riechmann learning style approach. Whereas other three dimensions i.e. collaborative, dependent and independent present within Grasha-Riechmann model are in common with three dimensions of Dunn & Dunn model i.e. teamwork, pair/peers and self respectively.

All of the above discussion can be summarised into a single table form that is represented below. Table E represents comparison of the learning style models on the basis of their dimensions.

Table E: Comparison of the learning style models

LEARNING STYLE MODELS	KOLB	HONEY AND MUMFORD	THE 4-MAT	GREGORC	FELDER-SILVERMAN	DUNN AND DUNN	BARSCH	VARK	GRASHA RIECHMANN	RASI
									avoidant	surface
	accommodator	activist	common sense	concrete-sequential	active	impulsive			participative	deep
									competitive	strategic
									collaborative	
									dependent	
									independent	
	converger	pragmatist	dynamic	concrete-random	sensing					
	diverger	reflector	imaginative	abstract-random	reflective	reflective				
	assimilator	theorist	analytic	abstract-sequential	intuitive	analytic				
					global	global				
					sequential					
					verbal	aural	auditory	aural		
					visual	visual	visual	visual		
						read/write		read/write		
						kinesthetic	kinesthetic	kinesthetic		
						room design				
						sound				
						light				
						temperature				
						motivation				
						persistence				
						responsibility				

Conclusion

In this paper, it is concluded that Kolb popularized an awareness of learning styles. Many models like Honey-Mumford, the 4-MAT, Felder-Silverman and Gregorc are directly or indirectly based on the work of Kolb's model. Whereas, other three models i.e. Dunn & Dunn, VARK and BARSCH contains dimensions related to aural, visual, kinesthetic and read/write. Dunn & Dunn is an model that contains maximum number of learning style preferences within it. Moreover, the two models i.e. Dunn & Dunn and Grasha-Riechmann described about collaborative, peers and independent styles of learning preferences within their models. All of the above models have been classified into three families of learning style preferences-

- learning styles and preferences are largely constitutionally based on VAKT
- flexibly stable learning preferences
- learning approaches & strategies.

IMPLICATIONS

In present paper, efforts are being made to describe about various models of learning styles along with their dimensions so that teachers can make use of these models to understand how different types of learners adopt different mechanism for their learning. It helps to find out various ways for every learner to be successful in his or her life. And moreover, it facilitates teaching learning process in a better way. Even assessing different types of learning styles provide the basis to give advice regarding student's motivation, classroom management, evaluation, curriculum development and assessment of students learning. It also helps counsellor to develop various strategies as well as techniques that are responsive to unique learning needs. Knowledge of learning styles is essential in improving instructional skills, curriculum development and assessment of student learning. This is applicable to all areas of education i.e. curriculum, instruction, leadership and counselling.

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