Redefining Learning: Kolb's Theory of Learning Styles with Gardner's Multiple Intelligences

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Abstract

This study attempts to bridge David Kolb's theory of Learning Styles Howard with Gardner's Theory of Multiple Intelligences to overcome criticisms to both. The necessity to sequentially achieve Kolb's four learning stages (concrete experience, reflective observation, abstract conceptualization, and active experimentation) and their respective preferred combinations are discussed as an onset. Succeeding that is an analysis of Gardner's Theory of Multiple Intelligences which claims intelligence to be one of eight types of independent arenas of competence, all independent of each other (linguistic. analytical, musical, bodily, interpersonal and intrapersonal, spatial and naturalist). Both theories suffer from certain drawbacks. For instance, Kolb's theory has sufficient empirical support but lacks scientific backing while Gardner's theory is bereft of empirical support but founded on clinical research on central nervous system. Utilizing a combination of both theories the study examines possibilities to improve quality of education, training and pedagogical advice. The purpose of this study is to examine both theories in detail so as to isolate unique concepts both scientifically accurate and empirically compelling with the intent to formulate a compound theory through active use of pragmatism and quality control. The paper further presents a real life model to overcome impediments faced by the two theories and proposes revisions in learning techniques to facilitate absorption of knowledge and synthetization of information in general educational practice at both amateur and professional level.

Keywords: education, learning styles, learning theory, multiple ıntelligences, pedagogical.

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1. Introduction

Seeing and hearing; reflecting and acting; reasoning logically and intuitively; memorizing and visualizing and drawing analogies and building mathematical models; steadily and in fits and starts: this are multiple ways a students learn (Felder & Silverman, 1988). For a given situation there is no one style which can suffice. Hence, when a student learns, the style may be distinctive to the assignment or may be duplicated on an experience. Styles influence how a students learn, how a teacher carries out his job, and the degree of interaction. Culture, personal experiences, maturation, and development act as a vessel which houses a student's biological or inherited characteristics (Cornett, 1983). For a considerable time, educators have noticed that a faction of students show an inherent preference to certain methods of learning than others (Eisenberg, 1991). Researches on learning styles have found that students' learning styles affect performance in a learning environment. Learning styles form a student's unique learning preference and help instructors in the planning of learning/teaching environment (Morrison, Kemp, Kalman & Ross, 1998). Defining, classifying, and identification can be done in different ways (Entwistle 2013; Kirby 1979).

The significance of the study comes to notice when the findings are viewed in reference to educational resources being abundant but judicial and efficient use of these resources being the need of the hour. In terms of priorities, education has taken a place second to only a few. In modern times when professional diaspora has widened like the universe and scope of expertise in various fields has grown exponentially, the theories discussed in this paper act as catalyst to learning and opening up of human mind after careful analysis and scrutiny of both observances made (Kolb) and neurological research carried on (Gardner).

2. What are learning styles?

Generally, learning styles are overall patterns providing direction to learning and teaching (Cornett, 1983). They are also set of factors, behaviors, and attitudes that facilitate learning for an individual in given situation (Brown & Hayden, 1980). Learning style is defined as personal qualities that influence a student's ability to acquire information, to interact with peers and teachers, and otherwise participate in learning experiences (Grasha, 1996). Learning styles are traits that refer to how individuals approach learning tasks and process information (Kemp, Morrison & Ross, 1998, p. 40). Jensen (2003) defined it as a preferred way of thinking, processing, and understanding information (p. 31). It refers to a person's characteristic style of acquiring and using information in learning and solving problems. Most studies focus on the success of learners in traditional learning environments, attitudes towards learning environments or the rate of involvement in the learning environment. One of the most popular learning style inventories and one that is often used in distance learning and for adult research is the Kolb's Learning Style Inventory (Kolb, 1986; Dillie & Mezack, 1991; Dowdall, 1991; Diaz & Cartnal, 1999; Miller, 2005; Liegle & Janicki, 2006). Few studies to date have evaluated the students' perceptions in learning styles and blended learning environment (Lemire, 2002; Raschick, Maypole & Day, 1998; Terrell & Dringus, 2000; Simpson & Du, 2004; Richmond & Liu 2005).

3. Significance in modern times

In the modern society of the 21st century individuality takes the center stage. A jack of all trades and master of none has to endure a mediocre life. However, if that can be changed, a huge push would be received by students across the world. A straight forward applied on every student approach to education fails to identify various different abilities of a student and moreover the imposition of a blanket pattern of education kills individuality and fails to identify the fields a student is exceptional is. On top of that the method of teaching remains the same for every student. Firstly, it fails to realize

that different students react to a method of teaching differently, secondly that some students have a propensity to work according to a certain method a while no other method appeals to them.

4. Kolb's Learning Styles

David Kolb made available his learning styles model in 1984, years after he had theorized it. 'Experiential Learning: Experience As The Source Of Learning And Development' was Kolb's book in which he identified with ideas on experiential learning by thinkers such as Carl Rogers and Carl Jung, two of the foundation scholars. Utilizing their logically sound and well-founded assertions as his backdrop, Kolb postulated his own model. Today his Experiential Learning Theory (ELT) and Learning Styles Inventory (LSI) are considered to be ground breaking, influential and used applied by academicians, teachers, human resource managers and mentors to discern human conduct and response to various forms of teaching with reference to learning. Kolb tendered to an understanding of experiential learning which can be defined with six characteristics: Learning is to be conceived as a continuous process separate from outcomes, grounded in experience requiring settling of conflicts between polar modes of holistic adaptation involving transaction between person and environment for creating knowledge from the symbiosis of social and personal knowledge (Kolb, 1984).

The cycle of learning is the cornerstone to Kolb's model, monikered as four-stage cycle of learning. Ground support for learning is catered by 'Immediate or concrete experiences' which lead to 'observations and reflections'. These 'observations and reflections' are incorporated and grasped into 'abstract concepts' producing new ramifications for action which can be 'actively tested' directing towards a new experience. This process ideally depicts a learning cycle or spiral where the learner 'touches all the bases' (McLeod, 2010).

Kolb's learning model is based on two continuums that form a quadrant. Understanding Kolb's quadrant can be confusing at first. A two-by-two matrix simplifies the task. The matrix also uses Kolb's parlance to identify the learning styles: diverging, assimilating, and converging, accommodating:

Ergo, a person with dominant learning style **'watching'** against 'doing' a task, and **'thinking'** rather than 'feeling' the experience, will have **'Assimilating'** as the corresponding learning style. Everyone responds to and needs the stimulus of all types of learning styles to one extent or another - it's a matter of using emphasis that fits best with the given situation and a person's learning style preferences (Brown, 2013)

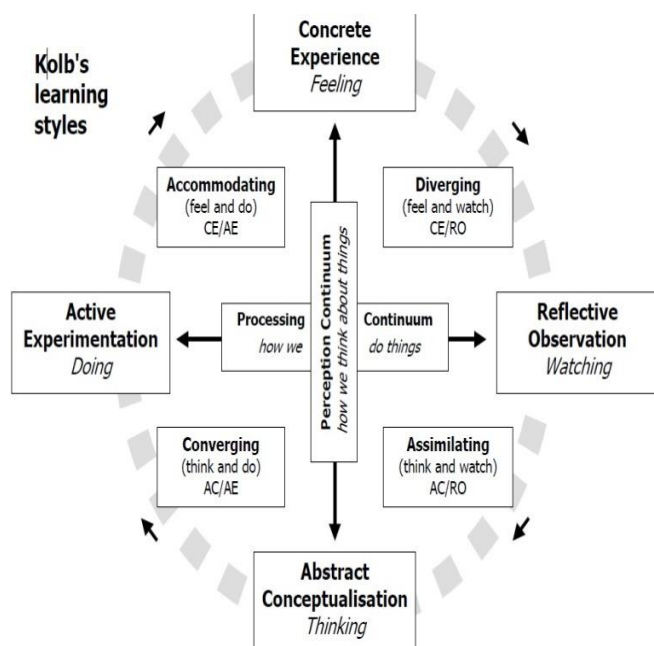|	Doing (Active Experimentation - AE)	Watching (Reflective Observation - RO)
Thinking (Abstract Conceptualization - AC)	Converging (AC/AE)	Assimilating (AC/RO)
Feeling (Concrete Experience - CE)	Accommodating (CE/AE)	Diverging (CE/RO)

Fig. 1. a) (Chapman); Table 1. Matrix

4.1 *Explanation to Kolb's learning styles:*

- **Diverging (feeling and watching - CE/RO)** - They prefer to watch rather than do, tending to gather information and use imagination to solve problems. They are best at viewing concrete situations several different viewpoints. They are interested in people, tend to be imaginative and emotional, and tend to be strong in the arts. People with the Diverging style prefer to work in groups, to listen with an open mind and to receive personal feedback. Divergents tend to be emotional, sensitive and imaginative with a proclivity towards people. Observe than act, feel than think is their motto. Therefore, they have the potential to use imagination to solve problems and overcome obstacles. Artists and brainstormers fit this style as they have regard for culture from which art stems and an inherent intrigue for information. They possess the ability to find meaning and value behind a task. They possess the ability to observe at a task from different vantage points. Divergent learners prefer the learning modes of concrete experiences and reflective observation.

- **Assimilating (watching and thinking - AC/RO)** - They are the portion of the society who form the idealists. To them ideas and concept are dominant and people take a back seat. Kolb (1984) has suggested that one of the assimilator's greatest abilities is to create theoretical models in assimilating disparate observations into an integrated explanation. Logical rather than practical aspects of the society appeal more to them. The Assimilating learning preference is for a concise, logical approach. Ideas and concepts are more important than people. Practical aspect of a theory is secondary to them. These people require good clear explanation rather than practical opportunity. They excel at understanding wide-ranging information and organizing it in logical format (Putintseva, 2006). These people are naturally effective in information and science careers. Readings, lectures, analytical models appeal more to their mind. Assimilative style incorporates the learning modes of reflective observation and abstract conceptualization

- **Converging (doing and thinking - AC/AE)** - Convergers possess a knack for tackling practical issues. They choose technical tasks over those involving people and interpersonal aspects. Taking a stance and decision making are their pros. Their talent of finding practical uses for ideas and theories outwits other learners. A Converging learning style enables specialist and technology abilities. Hypothetical reasoning is strong by virtue of being logical and practical. People with a Converging style like to experiment with new ideas, to simulate, and to work with practical applications. Emotionally very strong.
- **Accommodating (doing and feeling - CE/AE)** - The Accommodating prefers experience events hands-on dealing with problems using the sixth sense. Their method of approach is to utilize analysis of past experiences of people or their analysis, take a practical course coupled with some experimentation as they display traits of risk taking tendencies. Information from secondary sources it vital as they rarely carry out their own analysis. Source of secondary information is often a team with which they work. Action and initiative defines their personality. They adapt to changing circumstances. They set targets and actively work in the field trying different ways to achieve an objective.

4.2 Real world application

- Ride a bicycle: (RO)- Visualising riding it and observing a bike being ridden. (AC)- Grasping the mechanics behind working of the bike. (CE) Consulting an expert to receive advice. (AE)- Making an attempt to ride it.
- Write a software program: (RO)- Contemplating on the work that one just did. (AC)- Consulting books/manual and receiving theoretical information. (CE)- Resorting to the guide to obtain expert pointers. (AE)- Typing code and learning from mistakes.
- Coach someone: (RO)- Witness others teaching and make inferences. (AC)- Read up on teaching and advantages and theory behind different methods. (CE)- Being coached in order to coach. Akin to being taught how to teach. (AE)- Utilising social skills and experimenting with various approaches.
- Learning Integration: (RO)- Pondering over the fundamental of calculus and figuring out the why. (AC)- Getting to know the concept and explanations to solving the problem. (CE) Solving the equation focusing on every step in detail. (AE)- Continuous practice.

Kolb's theory might seem practical with real life applicability but its premise is thoroughly grounded on theoretic with no scientific backing of any sort. Imperical data has been gathered around the theory supporting it but being oriented with the mind, clinical evidence should also form the basis of a theory so closely related to the human consciousness and human brain. This drawback of the theory is its major drawback. This is where Howard Gardner's theory of Multiple Intelligences comes of use as it is based on clinical evidence

5. Howard Gardner's multiple intelligences

Howard Gardner defined intelligence as 'the capacity to solve problems or to fashion products that are valued in one or more cultural setting' (Gardner & Hatch, 1989). Howard Earl Gardner's publication "Frames of Mind: Theory of Multiple Intelligences" in 1983 revolutionized teaching and learning in schools across different cultures and societies (Mokhtar, Majidi & Foo, 2008). It conceived a novel view of learning amongst educators and practitioners, though it was unsuccessful in garnering

interest amid the faction of psychology research. The theory motivated researchers, educators and practitioners to formulate new approaches of imparting information.

Human cognition in its entirety forms the basis of the theory. The intelligences provided 'a new definition of human nature, cognitively speaking' (Gardner 1999). The theory that a single factor labelled the 'g' factor is the longest surviving theory in measuring Human Intelligence (Spearman, 1904; Terman & Merrill, 1937; Burt, 1941). Human beings are organisms who possess a basic set of intelligences and every individual possesses a distinctive amalgamation of these multiple intelligences resulting in a unique set of skills. These resultant skills can be utilized to either the good or evil of mankind. As per Gardner the challenge is how to best take advantage of the uniqueness conferred on us as a species exhibiting several intelligences (Gardner 1999). Howard Gardner initially formulated a list of seven intelligences. The first two have been typically valued in schools; the next three are usually associated with the arts; and the final two are what Howard Gardner called 'personal intelligences' (Gardner 1999).

Underlying characteristic of being fundamentally literate emerges from discovering how to learn; applies both to teachers and students (Carr, 1998). In a more abstract sense it can be said that revolutionizing teaching by opting for a resource based approach drawing attention to problem solving is the need of the hour. For without such teachers imbibing critical and analytical skills required in today's information rich age would be impossible (Hughes, 1998). Cultivation of human intelligence in domains which have individual proclivities and interests is an essential step in educational aspiration. (Eisner, 2004). If kids are to be inspired and trained to strive for excellence, passion is an unsaid pre-requisite. Hence it is desirable to allow students to pursue subjects or fields they are most comfortable with. Since comfort in a subject emanates from understanding and ease of learning, students would opt for the field they have greatest ability in and most interest for. Self-motivation would flow from such an arrangement promoting commitment in school. Focusing on their negatives would make them a jack of most trades and the master of none. Mediocrity and boredom would be the repercussion of implementation of such a technique.

With this approach Gardner challenges, the idea that assumes all students can imbibe the same information through a uniform and common process. It is this idea which needs to confronted and opposed. It needs to be established once and for all that a common system of education imparting is regressive and limits productivity hampering development and encouraging homogeneity of ideas destroying innovation and perspectives. Gardner (1983) proposed that each individual possesses, to varying degrees, seven primary forms of intelligences, namely (i) verbal-linguistic, (ii) logical mathematical, (iii) bodily-kinesthetic, (iv) visual-spatial, (v) musical, (vi) intrapersonal and (vii) interpersonal. The main idea behind Gardner's theory is that intelligence is not made up of a single universal entity, and instead takes on a plural form. Every individual possesses every single one of the intelligences proposed but to different extents, and it is through education that each of these intelligences can be nurtured and developed. An individual may be expected to be more receptive to learning if his dominant intelligence is exploited and used as a catalyst to encourage more erudition (Mokhtar, Majid & Foo, 2008).

Table 2. Gardner's classification.

		Description	Real World Jobs
1	Linguistic	Words forming language both written as well as spoken, expression, sharing of ideas via language, grasps use of communication and meaning.	writer, lawyer, journalist, speaker, English teacher, poet, linguist, translators, media consultant, TV/radio presenter.
2	Logical-Mathematical	Logically detecting patters between cause and effect before forming an inference using technical reasoning, deduction and mathematics.	deal-maker, statistician, director, scientist, engineer, computer geek, accountant, researcher, analyst, trades, banker, insurance broker.
3	Musical	Alertness, admiration and application of sound; Sense of tonal, rhythmic patterns, recognizes connection of sound and feeling	singer, composer, music producer, instrument tuner, acoustic engineer, Disco jockey mimicker, noise advisor
4	Bodily-Kinesthetic	Physical nimbleness agility, stability and quickness, eye and body coordination.	dancer, actor, athlete, divers , soldiers, fire-fighters; ergonomist, adventurer, circus performer.
5	Spatial-Visual	Construal of visual images; pictorial vividness capability, imagination leading to expression; Grasps use of images and meanings, between space and consequences.	Artist, designer, cartoonist, story teller, architects, photographer, sculptor, beauty advisors.
6	Interpersonal	Empathise; Grasps existence situations affecting people; behaviour and communications and their understanding.	Therapist, Human Resource, mediator, leader, sales-man, politician, teachers, organiser, nurse, advertising, coach, mentor.
7	Intrapersonal	Introspection, cognisance of self, objectivity to oneself, forming ideas of reasoning regarding self-action, self-actualisation, self-knowledge, anticipation of reaction.	Philosopher, theorist, writer, human self, motivational speaker

Gardner's theory of Multiple Intelligences is rather new and lacks empirical support. Without empirical support on its side, advocating and implementing the theory to real life scenarios becomes a dicey task. It is however based on the clinical evidence and deep study of the central nervous system, hence collecting empirical evidence should not be a herculean task. Moreover, another reason for lack of empirical evidence is the theory's long term process which requires following a student's learning process from the nascent stage to its conclusion.

6. Conflating both theories

The theory of multiple intelligences has often been conflated with learning styles. Gardner has denied that multiple intelligences are learning styles and agrees that the idea of learning styles is incoherent and lacking in empirical evidence (Strauss, 2013). By virtue of being separate ideas comprising of divided assumptions, multiple intelligences and learning styles fit each other akin to a handshake. Often completing the other without losing one's integrity under normal circumstances researches, teachers, educators apply either of the theories resulting in expected already documented results. The process has to be carried out cautiously paying attention to individual student, focal point being one to one integration with the faculty, his strengths being the center of attraction. Previously unobserved inference could be drawn when both the theories are amalgamated. A sample case of a gymnast is taken. The fact that he is a gymnast could be drawn from Multiple Intelligences as his prowess is in terms of Gardner's Bodily-Kinesthetics.

Multiple Intelligences facilitates in identifying the genetical framework and natural mindset of the student. His optimum area of working would be recognized allowing the process to move forward to the actual learning. Learning Styles would play the major role at this stage providing grounds for the

student to learn to according to his pace and his form of learning. It could be theoretical followed by a practical approach or a hands on experience providing the student to acquire a feel of the subject and later on understanding the theory behind it.

Step 1: Identify natural inherent prowess of student. Would fall under of the 7 documented by Gardner. It is not certain that only one prowess would be identified, but since it is difficult to pursue simultaneous objects prowess has to be identified in singular terms. The role of society and culture of one's upbringing acts as a significant factor. The learner's personal choice must also be taken into account for self-motivation must come or the process would become bore and an ordeal for him.

Step 2: Supposedly the learner, owing to his low weight, bone structure density, and most importantly his mind's inclination towards a great hand eye coordination coupled with his interest has opted to learn Gymnastics. Under normal circumstances the application of Multiple Intelligences would end here. But once compounded with Learning Styles, the process has to be carried on to the next stage.

Step 3: Learner's bent of mind would then be tested and natural proclivity towards a certain style would be used to facilitate learning. According to his learning style the teacher would modify teaching techniques.

Diverger: He would be subjected to videos on gymnastics and taken to gymnastic shows where he can watch and learn after feeling. Would be allowed to use his imagination to draw inferences and gather information eventually solving problems of technique, footwork, common mistake. A diverger would prefer to be taught in a group and providing solely one to attention would only be regressive to his learning. They tend to be emotional and take failure personally. These personal traits would have to be accounted for by the teacher. Diverger's ability to learn from concrete experiences and reflective observation fits perfectly with his dominant intelligence of Bodily-Kinethestics.

Assimilator: To an assimilator the initial step has to be detailed explanations of all the whys and hows. Since their learning approach is concise and logical, little scope remains for hand on experiences unless a conceptual understanding has been attained. Assimilator's ability to learn from reflective observations and abstract conceptualization also fits perfectly with this dominant intelligence of Bodily-Kinethestics provided the learning curve is not too steep.

Converger: A converger must be left to his own will after a providing a brief introduction to the idea and concepts. He shall then utilize his time by learning practically. Tackling practical problems faced during the process with his logical and practical approach for problem solving. A converger would not always accomplish a task based on standard evaluations. He would experiment and formulate new ways suited to him to accomplish the same task.

Accommodator: An accommodator would refuse to accept conceptual knowledge but would prefer to work with a team. Observing others and drawing inferences from those secondary sources with a will to not repeat their mistakes would be their way of learning gymnastics. Since secondary sources are vital, the teacher would have to set up an atmosphere where an ample amount of observations can be made. An accommodator gymnast must be allowed to fail and

try again. Their nature to set targets and actively work towards them would provide them enough motivation to keep working.

Conclusion

David Kolb's Learning styles' stress on separated rather individualistic approach of learning and Howard Gardner's content-oriented model of multiple intelligences are startlingly harmonizing and congruent. Unless and unit Learning Styles are pitted with Multiple Intelligences both concepts seem rather abstract with several obstacles between theory and pragmatism. Each theory manifests distinctive loopholes leading to criticisms and impracticability. However, once joined and read in reference to each other, each theory defeats the shortcoming of the other theory working the negatives, reducing them, and strengthening the already positive aspects of both. Without learning styles, multiple intelligence theory proves unable to describe different processes of thought and feeling. Each theory responds to the weaknesses of the other; together, they form an integrated picture of intelligence and difference.

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