

New Learning Styles Models in Adaptive Educational Process

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Abstract: This paper presented a new method in learning styles. This study focused on the learning styles studied by a group of researchers and obtained an insight into the most important styles. Through these styles, new learning styles have been formulated to give a broader base for researchers in the field of smart education to build educational systems that are able to deliver the educational subject to students better and faster.

Key Words: style; smart; model; learner; visual

Abstrak: Studi ini menyajikan metode baru dalam gaya belajar. Studi berfokus pada gaya belajar yang dipelajari oleh sekelompok peneliti dan memperoleh wawasan tentang gaya belajar yang paling penting. Melalui gaya-gaya tersebut, gaya belajar baru telah dirumuskan untuk memberikan dasar yang lebih luas bagi para peneliti di bidang pendidikan cerdas untuk membangun sistem pendidikan yang mampu memberikan pelajaran pendidikan kepada siswa dengan lebih baik dan cepat.

Kata kunci: gaya; cerdas; model; pebelajar; visual

INTRODUCTION

Understanding how a student learns is important in choosing learning strategies, however unfortunately, education often continues in old ways, ignoring differences Individualism among students and learning styles. Learning styles are defined as styles that express differences in individuals learning methods. The learning method is a relatively permanent and distinct direction for a large number of intellectual activities, characteristics, tasks and positions (Rayash, 2002).

Learning Styles Overview

First, Basque model. Pask (1976) (Perez et al., 2000) suggests a classification of learning styles and strategies that can be described and explained as follows. (1) Macro learning style (Gestalt): It includes two areas of learning: Gestalt learner, which is characterized by having an understanding a comprehensive overview of the topic before going into its details, while the second style is preferred Surface learner generalizations. (2) General learning style: It is characterized by the general-

ization of the learner pattern, which is a type of pilot learners, who can choose between metacognitive learning methods. (3) Sequential (stepwise) learning style: It includes two styles of learning: the style of the working learner, and the mode of uneducated learner. The first is characterized as a pattern of learners that prefers to follow in his education step by step, mentally analytically, he has his scientific methodology, while the second is a type of learner who does not see generalities, because it is involved in studying the details (Ramadan, 1990).

Second, Dunn and Dunn model. Dunn and Dunn (1993) defined learning style as the way for the learner begin to focus on a new and difficult information, to do and restore it. He considered that this interaction takes place in a manner that varies from one person to another, and he added that Learning style is a set of a biological, evolutionary personal qualities and traits that would make learning effective for some students and ineffective for others (Fadil, 1999).

This style provides a therapeutic and diagnostic educational framework, and depends on the theory that it is beneficial every student learns the best in his or her own way, and therefore calls for a choice of methods

students who prefer to learn them better, and use this information in design Educational procedures and conditions that suit this student's style (http://www.unc.edu/depts/ncpts/publications/learning_styles.htm) (Table 1).

Table 1. Elements of Learning Styles According to Dunn & Dunn

No	Style	Its Characteristics
1	Environmental patterns	Sound, light Temperature the design
2	Emotional patterns	Motivation Perseverance Responsibility Structure
3	Social patterns	self Couples The group Maturity Diversification
4	Physical patterns	The sweetest Eat and drink Time the movement
5	Psychological patterns	Holistic / analytical Related to the hemisphere of the brain Impulsive / reflective

Third, Kolb model. Dewey on the need to build learning based on experiments, and focuses on the importance of personal activity during the learning process, and on Piaget Jean's theory asserts that intelligence is the result of a brown interaction Peat and the environment. Their dialects, built after acquisition and after conversion. It is indicated after acquisition and capture the way individuals gain experience; this dimension includes two systems of knowledge. Kolb demonstrated that learning styles as a continuum of (1) Physical experience: indulging in a new experience; (2) Note: monitor and observe your new experience; (3) Defining abstract concepts: arriving at theories that explain notes; and (4) Practical experiment: using theories to solve problems and make decisions (Al Hammouri & Al Kahlout, 2006))

Psychologists have found that there are seven specific types of learning styles that is the method that students use to gain knowledge differ from one student to another. The styles are: (a) (Verbal/Linguistic): Linguistic Style. The ability to use the language, whether it is the mother tongue or foreign language until be able to express what is in the mind and also for the sake of understanding other people, and my best example that poets, writers, doctors, speakers, lawyers, merchants, and actors. In teaching learning strategies that consist

of writing letters, poems, stories, and descriptions. (b) Mathematical/Logical. Possessing the capabilities of logical and mathematical reasoning and the understanding of the basic principles in the system statement causation, just like the way scientists and logic scientists work. They can manipulate by numbers, amounts, and operations as well as the mathematics specialist. Like Archimedes, Isaac Newton, Galileo, Einstein. This pattern wants to practice learning strategies it consists in scheduling and organizing the facts. Using explanation skills. Use of icons and abstract formulas. Logical solution to problem-cutting, data and information analysis. Using graphic organization. Code analysis such as code analysis. (c) (Musical/Rhythmic). Having the ability to think about music and listen to music, the one who has this style knows it, may plays with it. Students with musical ability not only remember the music tracks easily, but also music occupies a large part of their minds and their being. (d) Bodily/Kinaesthetic: Body Style. The ability to use all or parts of the body (hands, fingers, arms). Analyse a specific problem, make something or offer types of products, learning which consists in making a systematic dance song (with motions). (e) Spatial/Visual style. The ability to visualize space science in a mind just as a leader of the plane or seas that have major space factor pockets. The owner of the imaginary potential can use it in arts and sciences, and if he has tendencies toward art, he may become a painter or architect. There is a specific science that focuses on this ability, like science anatomy and topology. This style focuses on practicing learning strategies that consist of making graphs, advertisements and drawing schematic, make a video or film, make poster templates, make a photo album, action maps and solids, use of colors and shapes, and development or use of guided horses. (f) Self-centered style (Intrapersonal) who have an understanding of themselves, search for their personal interests - have an understanding of the self. They know who they are and they know what they can do, what they want to do and what things they avoid, what are the things that they are attracted to and we (as teachers) seek those students who are they have an understanding of themselves because they have a tendency to frown. The desire to know where to go if they need help and have a great focus on internal feelings and dreams. This style tends to practice the learning strategies that are needed. (g) Interpersonal style. The ability to understand and lead other people and mediate their struggles, it's the ability that we all need it but essential if you are a teacher, a doctor, a trader, or political. Anyone who deals with other people should be

skilled in the social environment he lives in. This style tends to practice the learning strategies that it gives the teacher or fellowship student feedback. Appreciated by feeling other people’s feelings. Empathy appears (Compassionate) with others. Good to communicate with other people. Enjoys cooperative skills. Has collaborative learning strategies. Accept feedback. Understand others’ motivations and their needs. Participates in group projects. Teach new things to other people. Learn from people outside the school boundaries. He

expresses his views and has the ability to manoeuvre. The Table 2 gives more details about the seven discussed learning style.

Fourth, Marton and Saljo model. Through their studies, both Marton and Saljo found that there are two areas of learning: (1) Surface style; Where the students are interested in learning the text itself trying to memorize and remember the details facts, so their learning concept focuses on the quantity not on the quality. (2) Deep style; The attention of the students is focused on the content,

Table 2. Learning Style

Style	Must	Good in	Learn better in
Language learner (play words); learner linguistic “The word player	reading writing telling the storytelling	Keeping Absent: The Evening - Places - dates / And other things may be Trivial	Say (or tell) - listen Words and watch it
2- Logical / arithmetic learner (Questions) Mathematical learner “Questioner The”	Conducts / deduces The questions work with numbers / ask Explores patterns and relationships	Calculus / Logic / Solve the problem	Classification / tab / working with Conclusions and patterns And stuck
3- The cosmic learner (alien) or)English(Spatial learner “The visualize	Draw / design / create Things / day dreaming / looking bad For pictures / slides / watching Movies / playing with machine	Imagine things / feeling By changing Riddles / read Maps and regulations And data.)	Watching (The Vision) / Dream - Uses eyes minds eyes Work with colors and pictures
4- Music learner, working in colors and images. Musical learner “The musical lover	- Sing / ring tones And melodies. Musical instrument Listen to music /	respond to music - Capture sounds And imitate it / remember Instruments / Rhythm Observation Pitch / Save time	Rhythm melody Playing / composing / singing Music
5- Physical / mobile learner in music. bodily kinaesthetic “the mover	He always talks / touches - Uses non-verbal language Body language and movements	Sports Activity (Sports / Parchment / Acting (skills Manual and handcraft	Touch / movement / interaction With space / location - (Space) deals with Knowledge through feelings
6- The social learner Interpersonal learner “the socializer”	Have many friends / Speak to people / join In groups and groups.)	Others understand and understand people / leadership Regulation / Communication Using things and controlling Its spicy / mediating brown Conflicts and conflicts	Conflicts Participation / comparison / understanding Reality of feelings / link / Cooperation / Investigations /
7-Intrapersonal learner “the individual”	Work alone He only understands himself, takes care of his interests	Understanding himself only takes care of his personal interests. Focuses on himself His feelings and dreams / continued Intuition / caring for interests The goals are / are traditional	Individual work alone / projects Self-help instructions Get his space

meaning, significance and purpose of the writer from the text, this is because their concept of learning as a deduction process through it they study the relationship between the ideas presented by each other, then discussing the evidence, and linkages between that information regarding the previous information (Muhammad, 2007).

Fifth, Biggs model. Indicates that Biggs (1987) classified student's styles of learning when he built a questionnaire as follows: (1) Deep style includes: Attention to understanding, Interacting with the content, Linking new ideas to previous ones, Connect concepts with experience, Link evidence with conclusion, Researching the logic of proofs. (2) Surface style includes: Focus on the minimum requirements, Reliance on remembering, Failure to distinguish between principles and examples, Treat tasks as out of memory, Focus on the elements without integrating them. (3) Achievement style focuses on: Attention to achieving the highest score, Attention to organizing time and distributing effort, Use previous exams to predict questions

Sixth, Entwistle model. He has identified five styles of learning: Deep learning style, surface learning style, understanding learning style, process-oriented style, and achievement-oriented style (Ramadan, 1990). Classification of learning methods from the last discussion, we can classify learning styles into three main types: cognitive, personality (psychology), and sensory. Learning styles are only the most important in our study which will be described as follows. (1) Visual versus verbal. Visual learners prefer to think about pictorial objects and obtain information through visual aids such as video charts. On the other hand, verbal learners get more information by speaking or writing (Felder, 1996). (2) Auditory learners. They prefer channels like listening to other people's speech. These learners understand the meaning by focusing on the pitch, tone and speed of sound (Felder, 1996). (3) Kinetic or tactile learners. They prefer moving and working with things tangible (Felder, 1996). (4) Intuitive (random) vs sensor (sequential). (5) Intuitive learners prefer information that originates from their imagination, reflection and inner memory. They think of futuristic, large-scale ways and enjoy creating new theories and possibilities. On the contrary, sensible learners prefer information that comes from the senses. They think here and now, and they prefer facts over theories. They want to be guided and educated by teachers (Felder, 1996). (6) Global versus analytical. Global learners focus on the big picture and follow their instincts or guess the main idea of the text. They like short answers rather than long explanations. On the

other hand, analytical learners focus on logical analysis and thinking to tackle problems. They break ideas and tend to focus more on grammar (LdPride, 2012). (7) Active versus reflector. Active learners enjoy performing tasks directly by applying and discussing them with others and working in groups, while reflective learners understand and remember information better by thinking ahead of time and acting individually (LdPride, 2012).

IMPORTANCE OF LEARNING STYLES

Learners are supposed to learn better, if they learn in styles that match their instructional form. For example, the visual learner may learn better, when the information is provided to him/her visually. This approach is called the "learning hypothesis" or, in its modern form, "connectivity" or "congruent hypothesis" (Pashler et al., 2008). On the contrary.

Incompatibility may have negative effects on learners. In the following sections some discussions will be presented based on a literature review related to learning hypothesis or matching hypothesis.

Learning styles play an important role in the lives of learners. When students introduce themselves to a learning style, they will be able to integrate them into their learning process. As a result, the learning process will be fun, faster and more effective. Moreover, teachers should try to adjust their teaching methods to match the learning styles of their students. However, sometimes a mismatch may be especially important with low-level students because they are disappointed in the early stages of learning but It should be done with caution. Additionally, Peacock (2001) suggests that "teachers should strive for a balanced teaching style that does not overly favour any single educational method, rather than trying to accommodate multiple learning styles." Learning strategies used by students with different learning styles.

From his study, it was found that among 79 students, the majority of students have one learning style (N = 48), followed by two learning styles (N = 23), three learning styles (N = 5), four learning styles (N = 2), and five learning styles (N = 1). It was also found that the strategies behind cognitive and Meta cognitive were mainly used by students. However, it should be noted that students who prefer to work on their own activity have reported the main use of metacognitive strategies while dealing with the skills.

The implications of the study involve increasing the effectiveness of teaching and learning in the class-

room. Provide activities to suit student's different approaches to developing their skills based on the task-based learning framework proposed by Williamson and Watson (2006). It consists of three phases - the previous task, the task cycle, and the linguistic focus.

While students do activities in the classroom, their teachers must do this to play the role as a facilitator for their scaffolding to use a variety of strategies to learn more effectively. For students, being aware of the specific goal and language skills they want to achieve are essential while learning. In order to learn more effectively, they must also learn to expand and develop their own learning strategies by interacting and working with others such as their teachers and friends.

PROPOSED LEARNING STYLES MODELS DURING THE EDUCATIONAL PROCESS

Role of Learning Styles

As described before, learning styles is a very important factor in the learning methods. Knowing more about the student's learning style will give better methods in customization of the learning objects. Using learning styles detection is done better through web based education in the way that we can use artificial intelligence to gather information, analyse and build the learning strategies.

The student learning style will help in the customization and the personalization of the learning objects, at the same time it will be a main factor in the intelligent tutoring systems and adaptive learning.

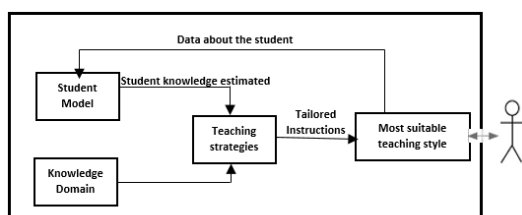


Figure 1. Role of Learning Styles

AS shown in Figure 1, teaching strategies is created according to the student model which is estimated through the most suitable teaching style to the student coming from tailored instructions.

Proposed Learning Style Models

Regarding the last discussion we can create our own view about learning styles based on several factors as described in the Table 3.

Table 3 describes three sections regarding the characteristics of the students. Section one is the learning styles of the students. Section 2 is the preference of the study by getting lectures or by collaboration with other students. The third section is the background of the student in the previous concepts.

Making a combination of these characteristics we can get 36 new models of learning styles of the student. The Table 4 described a sample of these learning style.

The learning process according to the new learning styles could give more accuracy by providing the students the learning objects matching his style. Figure 2 describes the process.

CONCLUSION

Obtaining learning styles based on more than one characteristic of the student will help researchers to create a smarter and more educational system that can deliver the educational material to the student. Previous research focused on learning styles related to the level of understanding of the educational subject, but there

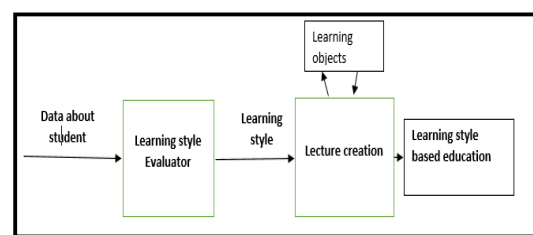


Figure 2. Learning Style Process

Table 3. Characteristics of The Students

Style	Interests						Background				
	Auditory	Visual	Kinetic	Intuitive	Global	Active	Collaboration	Presentation	Expert	Middle	Weak
Code	A	V	K	I	G	T	C	P	E	M	W

Table 4. Sample of The 36 New Learning Styles

Style	Description
ACE	The student is listener collaborative and expert in previous concept
APE	The student is listener likes presentation and expert in previous concept
APM	The student is listener likes presentation and medium in previous concept
ACM	The student is listener collaborative and medium in previous concept
VPW	The student is visual likes presentation and weak in previous concept
VCW	The student is visual collaborative and weak in previous concept
VCE	The student is visual collaborative and expert in previous concept
VPE	The student is visual likes presentation and expert in previous concept
KCM	The student is Kinetic collaborative and medium in previous concept
KPM	The student is Kinetic likes presentation and medium in previous concept
KPW	The student is Kinetic likes presentation and weak in previous concept
KCW	The student is Kinetic collaborative and weak in previous concept
IPE	The student is intuitive likes presentation and expert in previous concept
ICE	The student is intuitive collaborative and expert in previous concept
ICM	The student is intuitive collaborative and medium in previous concept
IPM	The student is intuitive likes presentation and medium in previous concept
GCW	The student is global collaborative and weak in previous concept

are other important factors that affect the student's ability to learn. Learning through teamwork or receiving presentations is extremely important to the student's educational capabilities. Also, his scientific level with the previous concepts, on which he depends on understanding the current concept, affects his understanding. Therefore, it is very useful to create learning styles with a new structure that takes into account these matters which can be the basis for the future studies to establish an educational system based on what we have found in our study.

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REFERENCES

Al-Hammouri, H. & Al-Kahlout, A. (2006). The underlying structure of the questionnaire and the learning patterns: An empirical analysis, educational and psychological sciences. *Bahrain*, 2(1), 716–779.

Fadil, N.Z.M.O.A. (1999). *Court preferred learning methods: Analysis in the light of gender and specialization variables, total education and science psychology*. Egypt: Faculty of Education, University of Minya.

Felder, R.M. (1996). Matters of style. *ASEE Prism*, 6(4), 18–23.

LdPride. (2012, March 29). What are learning styles? Retrieved from <http://www.ldpride.net/learningstyles.MI.htm>.

Muhammad, M.I. (2007). *Efficiency of cognitive representation of information in light of Manoj Biggs III* (Unpublished master's thesis). Minia University, Egypt.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological science in the public interest*, 9(3), 105–119.

Peacock, M. (2001). Match or mismatch? Learning styles and teaching styles in EFL. *International Journal of Applied Linguistics*, 11(1), 1–20.

Pérez, T. A., López, R., Gutiérrez, J., & González, A. (2000). Learning basque in a distance-adaptive way. In *Computers and Education in the 21st Century* (pp. 251–262). Springer, Dordrecht.

Ramadan, R.H. (1990). *The effect of the interaction of the learner's learning style, the cognitive style and the learner's learning style on academic achievement* (Unpublished doctoral dissertation). Benha College of Education, Zagazig University, Egypt.

Rayash, H.M.A. (2002). *Knowledge learning*. Amman: Dar Al Masryah.

The Dunn and Dunn Learning Style Model of Instruction (http://www.unc.edu/depts/ncpts/publications/learning_styles.htm).

Williamson, MF.& Watson, R. (2006). Learning styles research: Understanding how teaching should be impacted by the way learners learn. *Christian Education Journal*, 3(1), 27–43.