

The relationship between multiple intelligences and learning styles among sciences and techniques of physical and sport activities Institute students

علاقة الذكاءات المتعددة بأساليب التعلم لدى طلبة معهد علوم وتقنيات النشاطات البدنية والرياضية

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Abstract: This study aimed for investigating the relation between multiple intelligences and learning styles of sciences and techniques of physical and sport activities Institute students. A sample of (115) male and female students representing university levels and faculties was chosen for this purpose, the sample was selected randomly. We used index learning styles and Mckenzie's (1999) multiple intelligences Inventory; The data was analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows (version 21).

The results showed that there is statistically significant relationship between the learning styles and multiple intelligences, The relationship appears between active style and bodily-kinesthetic intelligence, and also between active style and Interpersonal intelligence, and between reflective style and Interpersonal intelligence, and between visual style and Interpersonal intelligence, and between verbal style and Interpersonal intelligence, and between learn style verbal and Spatial intelligence, the eight learning styles influenced and were influenced by the nine intelligences.

Key words: preferred learning styles, multiple intelligences, sciences and techniques of physical and sport activities Institute students.

الملخص:

هدفت الدراسة الى الكشف عن العلاقة بين الذكاءات المتعددة وأنماط التعلم لدى طلبة معهد علوم وتقنيات النشاطات البدنية والرياضية، لتحقيق الهدف تكونت العينة من 115 طالب منهم الذكور والاناث من المستويات ومختلف التخصصات بالمعهد، حيث اختيرت العينة بطريقة عشوائية، استخدم مؤشر أنماط التعلم ومقياس

الذكاءات المتعددة ماكنزي 1999 ، عولجت البيانات باستخدام برنامج الحزمة الاحصائية للعلوم الاجتماعية SPSS الاصدار 21.

أظهرت النتائج وجود علاقة ذات دلالة احصائية بين أنماط التعلم والذكاءات المتعددة ، ويظهر وجود ارتباط بين النمط النشط والذكاء الحركي، والنمط النشط والذكاء الاجتماعي، والنمط التأملي والذكاء الاجتماعي، والنمط البصري والذكاء الاجتماعي، والنمط اللفظي والذكاء الاجتماعي، والنمط اللفظي والذكاء المكاني، والنمط البصري والذكاء المكاني، أنماط التعلم الثمانية تتأثر وتتؤثر في الذكاءات التسع.

- الكلمات المفتاحية : - الذكاءات المتعددة، أنماط التعلم، طلبة معهد علوم وتقنيات النشاطات البدنية والرياضية

-Theoretical chapter

* Introduction and problematic of the study:

The successful teacher is the one who can turn his lesson to an atmosphere of interaction and harmony so that he has the full capability to contain the desires and tendencies of his students (messaoud & MESAHLI Sghir, 2013), So The teacher is obliged to transport the required information and knowledge to accomplish the educational behavioral change in a convenient pattern that sparks the interest and desire of the learner (bentabet, 2015).

Over centuries, Scientists and researchers were interested in understanding and treating individual differences between educated people, so there were so many domains to specify and determine these differences among them: personality, intelligence, thinking and learning. A lot of theories appeared, and were interested in studying each concept alone, there were a huge efforts specially in intelligence and the method of learning it so humans keep up with the huge scientific progress and the need of community.

Intelligence is considered as one of the important varying capabilities in people, as it is considered as a criterion for judging people: this is very smart or less intelligent, its identification was related to success or failure in the study,

ignoring its success in other areas, but this method that was followed in determining the level of intelligence lasted for a long time. But it did not persist. So several theories and trends criticized this trend and called for the multiplicity of intelligence. It gave the term intelligence a new concept. Among the most prominent of these theories is the multiple intelligence theory (MI) of its owner, Gardner, who called for the existence of nine different and integrated intelligences among the individual, but the difference lies in the degree of these intelligences among the individual himself, as it justified and explained the success of people in many fields compared to other fields, for example the skilled football player, if he was not successful in his studies, he is not stupid but intelligent, he is dominated by one of the types of intelligence that were identified by the theory, which is bodily-kinesthetic intelligence.

Gardner identifies intelligence as competence must entail a set of skills of problem solving enabling the individual to resolve genuine problems or difficulties that he encounters and, when appropriate, to create an effective product and must also entail the potential for finding or creating problems there by laying the groundwork for the acquisition of new knowledge (Gardner, 2011, pp. 64-65), so he thinks that it is of the utmost importance that we recognize and nurture all of the varied human intelligences, and all of the combinations of intelligences. We are all so different largely because we all have different combinations of intelligences (Armstrong, 2009, p. 6), and he mentioned 9 types of intelligence (Armstrong, 2009, pp. 7-9):

Linguistic: The capacity to use words effectively, whether orally or in writing. This intelligence includes the ability to manipulate the syntax or structure of language, the phonology or sounds of language, the semantics or meanings of language, and the pragmatic dimensions or practical uses of language.

Logical-mathematical: The capacity to use numbers effectively and to reason well, This intelligence includes sensitivity to logical patterns and relationships, statements and propositions (if-then, cause-effect), functions, and other related abstractions.

Spatial: The ability to perceive the visual-spatial world accurately and to perform transformations upon those perceptions. This intelligence involves sensitivity to color, line, shape, form, space, and the relationships that exist between these elements.

Bodily-kinesthetic: Expertise in using one's whole body to express ideas and feelings and facility in using one's hands to produce or transform things. This intelligence includes specific physical skills such as coordination, balance, dexterity, strength, flexibility, and speed, as well as proprioceptive, tactile, and haptic capacities.

Musical: The capacity to perceive, discriminate, transform, and express musical forms. This intelligence includes sensitivity to the rhythm, pitch or melody, and timbre or tone color of a musical piece.

Interpersonal: The ability to perceive and make distinctions in the moods, intentions, motivations, and feelings of other people. This can include sensitivity to facial expressions, voice, and gestures;

Intrapersonal: Self-knowledge and the ability to act adaptively on the basis of that knowledge. This intelligence includes having an accurate picture of oneself (one's strengths and limitations); awareness of inner moods, intentions, motivations, temperaments, and desires; and the capacity for self-discipline, self-understanding, and self-esteem.

Naturalist: Expertise in the recognition and classification of the numerous species—the flora and fauna—of an individual's environment. This also includes sensitivity to other natural .

And as for the theory of learning styles, it aimed that every learner has learning styles of his own like "Tilley Mortimore" clarified that Learning style is one aspect of cognitive style (MORTIMORE, 2008, p. 6) , It was defined by Rita and Dun as:" learning style is the way in which each person begins to concentrate on process and retain new and difficult information" (DUN & Shirley A. GRIGGS, 1995, p. 14) and Learning style is preferred way of thinking processing and understanding information (Nieter, Jeanna Sheve, & Kelli Allen, 2010, p. 9).

Understanding learning styles means educators have a better understanding of how to offer students different options so learning activities can be tailored to each individual's preferred learning styles, to be successful leaders; teachers must provide a variety of learning approaches for their students so these individual differences can be recognized and accommodated (Nieter, Jeanna Sheve, & Kelli Allen, 2010, p. 11).

We were provided by so many classification for learning style like the one of Kolb model, Biggs model, Entwistle's, Dunn's and and so many others, the ones I mentioned are the most famous and known, and i decided to use in this study the model of Felder and Sliverman.

The Felder-Silverman learning style model (FSLSM) is tested using the the Felder and Soloman's index of learning styles (ILS); the dimensions of learning preferences are :

The sensing-intuitive (S-I): dimension with the way information is perceived, sensing learners are practical , oriented toward facts and procedures, and favor information arriving through their senses, intuitive learners are conceptual, innovative, oriented toward theories and meaning, and favor information that arises internally through memory, reflection and imagination.

The visual-verbal (V-V): dimension with the way information is presented, visual learners prefer pictures, diagrams, graphs, flow charts, experiments and demonstrations, while verbal learners prefer written or spoken explanations and formulas.

The active-reflective (A-R): dimension deals with the way information is processed, active learners learn by trying things out, working in a group, and discussing; reflective learners learn by thinking through and working alone.

The sequential- global(S-G) : dimension deals with understanding sequential learners are linear orderly, learn in small incremental steps, can solve problems with incomplete understanding but may lack a grasp of the big picture. Global learners are holistic, systems thinkers and learn in large leaps. They grasp the total picture; they can often see connections that escape sequential learners. (Karacapilidis, Mahesh S. Raisinghani, & Eugenia M.W. Ng, 2013, pp. 80-81)

So the theory of multiple intelligences and learning styles are ones of the topics that are related to the changes of the century, due to the fact that both are intertwined in every form and appearance of individual differences because the two were interested in explaining the reasons of variation in students and that's what the institute of science and techniques of physical activities is looking for. And starting of studies recommendations like the study of Mathew and his colleagues (2013) That recommended future studies on multiple intelligence should investigate how the unique aspects of competency-based clinical education example : teaching style, learning ..., might be affected by MI specific pedagogy in athletic training education (Matthew R. Kutz, 2013, p. 8). So we must know the intelligences for educators in advance considering the method of collecting and the teacher also recognizes the types and forms of intelligence for his students before the process of educating, so he get the chance to understand and also will be able to adapt his methods of teaching according

to what every educator has as a type or types of intelligence, we can say the theory of multiple intelligences depends on a certain content unlike the theory of learning styles that deals with any type of educating content.

So is there any relation ship between multiple intelligences and learning styles among the students of the institute? And to be more precisely :Is there any relation between the nine dimensions of multiple intelligences scale and the eight learning styles among the students of the institute?

Hypothese:

There is a correlational relationship of statistical significance between multiple intelligences and Learning styles.

this study seeks to explore any possible relation ship between MI and learning styles. There are many studies try to treat theorie of MI such as Sümmani's (2011), his main purpose was to analyze the multiple intelligence levels of academies of physical education and sports students according to some demographic factors, the study of Murat (2015) also tried to explore the possible effects and relations of athletic participation in school sports competitions on MI types of high school female students.

On the other hand, there are studies of learning styles, such as study of Tea And his colleagues (2015) that was to characterize athletes with regards to their preferred learning style.

By looking at the studies associated with, the current study gets its importance from the nature of the variables that are addressed in the few studies that dealt with the theory of multiple intelligences and learning styles together in one study and research in the relationship between them, in addition to the importance of the two theories studied on the educational scene and their interpretation of learning differences, although the importance of previous

studies and its focus on topics with Direct or indirect link to the subject of the study except that it differs from these studies in the knowledge.

the importance appears in the following points:

- Showing the theory of multiple intelligences as a modern visualizing to human intelligence so it aims to provide with the needs And individual variations among students in the academic education by the diversification that is offered by the teacher in situations and educational activities in the one unit study, so we find the educator benefits from these activities and situations that corresponds to his individual intelligences.
- Showing the theory of learning styles and adopting the model of Felder and Silver man that differs from other models in the way of determining the education dimensions through combining it to other models and put it in one global and inclusive model.
- The lack of the local studies specially in arabic that touched in the research the relation between multiple intelligences and the theory of learning styles.
- The study used Learning Styles Index of "Felder and Soloman" (1997) after its translation from French into Arabic, thus providing the study with a translated standard that can be used by other researchers.
- This study presents the differences between learners from the abilities that they have (multiple intelligences) to the way of receiving and learning them (learning patterns), and thus the current study pours into the individual differences between students.
- Lack of studies that dealt with the nine intelligence, where the current study included the theory of multiple intelligence that includes nine

intelligence, which are: linguistic intelligence, mathematical logical intelligence, spatial visual intelligence, bodily-kinesthetic intelligence, musical intelligence, social intelligence, personal intelligence, natural intelligence, Existential intelligence.

- The lack of studies that dealt with the two theories or one of them in the studied specialty. so the majority of studies were ones that treated other fields.

The practical chapter :

1- Followed Methodologies :

After talking about Literature and previous studies, we have chosen Felder and Soloman's index for learning styles (ILS) and the scale of Mckenzie for multiple intelligences, it was adopted to the local environment, also we have confirmed the Psychometric properties after implementing it on a exploratory sample, then distributing in on 115 students.

Sample:

This study seeks to explore any possible relationship between MI and learning styles, Participants in this study were **115** students from STAPS institute university of Batna, 96 male and 19 female , and the sample was selected randomly in the academic year 2014.

Instruments:

multiple intelligence Inventory:

We used Mckenzie's (1999) MI Inventory, The questionnaire includes 90 statements, 10 on each of Gardner's nine intelligences which are: linguistic intelligence, mathematical logical intelligence, spatial visual intelligence, bodily-kinesthetic intelligence, musical intelligence, social intelligence, personal intelligence, natural intelligence, Existential intelligence.

Learning style:

The scale ILS consists of 44 questions and is available online, it provides four values between +11 and -11 ,one for each dimension, using the active-reflective dimension as an example , the value of +11 means that a learner has a strong preference for active learning ; where the value of -11 indicates that a learner has a strong preference for reflective learning. (Adelsberger, Kinshuk, & Jan Martin Pawlowski, 2008, p. 184)

Psychometric properties:

Face validity for MI:

Show the scale to group of special judgments , the proportion of agreement between the judges in scale's vocabulary between 90%-100% and by that percentage of agreement became an evidence of its validity.

Constrict Validity for MI:

To achieve the validity of constrict for the scale. the Coefficient of correlation was calculated between its sub-dimensions, and the results are in table 1

Table 1: correlation between dimensions of MI inventory

	bodily- kinesthetic	Linguistic	Social	Personal	Musical	spatial visual	Mathematical	Natural	Existential
bodily- kinesthetic	-								
Linguistic	0.265	-							
social	0.058	0.349	-						
personal	0.147	0.073	0.123-						
Musical	0.287	0.068	0.251	0.306	-				
spatial visual	0.138	0.060	0.322	0.264	0.294	-			
mathemat ical	0.129	0.287	0.072-	0.199	0.226	0.394	-		
natural	0.186	0.142	0.209-	0.066	0.226	0.320	0.280	-	
Existential	0.425	0.416	-0.306	0.361	0.079	0.312	0.386	0.393	-

from Table number 1 : The correlation coefficients between the nine dimensions are weak, as it ranged between 0.066 to 0.416, because the paragraphs related to each dimension measure something different from what the paragraphs related to other dimensions measure.

Cronbach's Alpha reliability for MI:

Table 2: Cronbach's Alpha reliability for McKenzie's questionnaire and its sections

Intelligence	NUMBER OF ITEMS	Cronbach's Alpha
bodily-kinesthetic	10-1	0.631
Linguistic	20-11	0.664
Social	30-21	0.647
Personal	40-31	0.795
Musical	50-41	0.810
spatial visual	60-51	0.600
mathematical logical	70-61	0.809
Natural	80-71	0.838
Existential	90-81	0.826
Total score	90	0.735

The reliability index for the whole questionnaire was 0.735 and all components also showed high indexes between 0.631-0.838. This means that the tool is characterized by high stability.

Face validity for ILS :

Show the scale to group of special judgments , the proportion of agreement between the judges in scale's vocabulary between 90%-100% and by that percentage of agreement became an evidence of its validity.

Constrict Validity ILS:

To achieve the validity of constrict for the scale. the Coefficient of correlation was calculated between its sub-dimensions, and the results are in table 3

Table 3: correlation between dimensions of ILS

	sensing-intuitive	visual-verbal	active-reflective	sequential-global
sensing-intuitive	-			
visual-verbal	0.035	-		
active-reflective	0.277	0.056	-	
sequential-global	0.117	.0.168	0.188-	-

from Table number 3: The correlation coefficients between the nine dimensions are weak, as it ranged between -0.188 to 0.277, because the paragraphs related to each dimension measure something different from what the paragraphs related to other dimensions measure.

Cronbach's Alpha reliability for ILS:

Table 4 :Cronbach's Alpha reliability for index of learning styles (ILS)

Learning styles	NUMBER OF ITEMS	Cronbach's Alpha
The sensing-intuitive	41-37-33-29-25-21-17-13-9-5-1	0.711
The visual-verbal	42-38-34-30-26-22-18-14-10-6-2	0.559
The active-reflective	43-39-35-31-27-23-19-15-11-7-3	0.757
The sequential- global	44-40-36-32-28-24-20-12-8-4	0.656
Total score	44	0.670

The reliability index for the whole questionnaire was 0.670 and all components also showed high indexes between 0.757-0.656. This means that the tool is characterized by high stability.

Statistical analysis: was done using the Statistical Package for the Social Science (SPSS) 25.0 for Windows

2- Exposure , analyses and result exam :

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To check if there is any relationship between multiple intelligences and learning styles among the students of the institute, we used correlation coefficient between dimensions of the variables.

Table 5 : correlation between dimensions of the variables

	bodily-	Linguistic	Social	personal	Musical	spatial visual	mathematical	natural	Existential
Active	0.195 *	0.091	**0.299	0.009	0.044	0.050	0.044	0.006	0.097
Reflective	*0.195	0.091	**0.299	0.009	0.044	0.050	0.044	0.006	0.097
Sensing	0.046	0.053	0.108	0.094	0.013	0.063	0.013	0.117	0.036
Intuitive	0.055	0.053	0.084	0.094	0.017	0.051	0.017	0.128	0.23
Visual	0.140	0.001	*0.210	0.131	0.031	*0.204	0.031	0.029	0.128

Verbal	0.173	0.042	*0.207	0.163	0.011	*0.207	0.011	0.003	0.139
Sequential	0.069	0.22	0.151	0.100	0.106	0.56	0.106	0.072	0.012
Global	0.030	0.019	0.148	0.127	0.139	0.081	0.139	0.068	0.006

The correlation analysis results presented in Table 5 demonstrate significant relationship between MI and LS. The relationship appears between active style and bodily-kinesthetic intelligence, and also between active style and Interpersonal intelligence, and between reflective style and Interpersonal intelligence, and between visual style and Interpersonal intelligence, and between verbal style and Interpersonal intelligence, and between learn style verbal and Spatial intelligence,

This is what was agreed with the results of study TEE and his colleagues(2009), That there is relationship between MI and LS. This correlation may be due to the service of specific intelligence capabilities of a learning style, it means the presence of common factors required or available in a particular intelligence and learning style, for example the active style of its owner is characterized by movement and activity that exist in Bodily-kinesthetic intelligence, and the active style in turn interacts with others positively. This requires social intelligence, or it can be said that social intelligence necessarily provides social relationships through which the learner with an active style interacts, and so on.

Conclusion:

There is no doubt when we talk about the importance of both theories in this study, it appears in its Seriousnesses and effectivenesses specially both of them came into sight in this current era.

The theories already proven success and influence in the educational process in calling the individual differences between students which became a necessity and a requirement and one of the rights for educator so he can have an education, unlike before.

Also both theories touched nearly all the specialties and for that even the studied aspect related to specialization has been affected, that's what made us try to discover and stumble on multiple intelligences and learning styles among students of this field the relationship between the both.

Suggestions:

1-Work on creating training sessions for professors that adopt modern methods based on multiple intelligence strategies, and urge professors to observe the learning styles of each student.

2-Taking into account the newcoming students of the specialty in terms of multiple intelligences, and include them in the admission tests.

3-Professors should reveal and in the same time learn about students' learning styles during the teaching process.

4-inviting the researchers to treat this topic from other aspects and starting a practice and applied study on Specialization

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