



Survey Analysis To Identify the Creative Thinking Attributes To Cope E-learning Strategies To Improve e-Learning Process

*Hanan Etaher Dagez¹, Hassan Al Sari²

¹Department of Software Engineering-Faculty of Information Technology-University of Tripoli,
Libya

²Information Technology Department, School of Applied Sciences, Academy of Graduate Studies,
Tripoli

*Corresponding author: h.dagez@uot.edu.ly

Abstract This paper is part of research attempted to develop an intelligent tutoring systems to support who have the characteristic of creative thinking to gain efficient knowledge in appropriate e-learning strategy. This is part of intelligent tutoring system uses neural network to obtain the characteristic of creative thinking student level and accommodate them in appropriate e-learning strategy. This paper presents the analysis and survey result conducted to determine the characteristics of talented and creative thinking.

Keyword: e-learning strategy, talented learner, creative thinking.

دراسة تحليلية لتحديد خصائص التفكير الابداعي واستراتيجية التعليم الالكتروني لغرض التحسين والتطوير

*حنان الطاهر الداقيز¹ و حسن ضو الساري²

¹قسم هندسة-البرمجيات-كلية تقنية المعلومات-جامعة طرابلس، ليبيا

²قسم تقنية المعلومات-مدرسة العلوم التطبيقية-أكاديمية الدراسات العليا جنزور

*للمراسلة: h.dagez@uot.edu.ly

المخلص هذه الورقة عبارة عن جزء من بحث يهدف للعناية بالتفكير الابداعي و تطوير قدراتهم في التحصيل العلمي في بيئة التعليم الالكتروني والذي نتج عنه بناء نظام الكتروني ذكي يستخدم تقنية الذكاء الاصطناعي، فهذه الورقة تقدم تحليل في عملية استخلاص و تحديد خصائص فئة التفكير الابداعي التي تم استنباطها من عدد من النظريات و ما يتماشى مع بيئة التعليم الالكتروني، كما تقدم ايضا نتائج الاستبيان لتحقيق من نجاح النظام و فعاليته.

الكلمات المفتاحية: لتعليم الالكتروني، التفكير الابداعي، استراتيجيات التعليم الالكتروني.

I. INTRODUCTION

Creativity is not exclusive to the intelligent or to a group of people, race or sex, but is related to the ability of the individual to be free from fear and threat. It is linked to the efforts of the individual and self-efficacy and adequacy, and is based on the individual's perception of the characteristics, competencies and skills. Hence, adapting smart systems to support e-learning has been the most important method used to nurture and develop creativity directly, in separate programs of its own, or indirectly as in curriculum activities across different subjects, or both. E-learning plays a major role in the dissemination of knowledge because of the great development in information technology and the spread of the Internet. Recent years many research concern on using and developing smart e-learning systems. However, still not provide differences in learning style and creative thinking an attention to as in face to face classroom does. Developing the abilities of innovators and creators can gain the required knowledge efficiently in the shortest possible time. Moreover, providing the appropriate tools for the category of creators helps to develop their abilities and increase their creativity competence in solving

issues and learning, in addition to the diversity strategies for difference creators may suit different e-learning techniques.

It was necessary to build a smart system adapted to the needs of the student and make a quantum leap in the educational environment in all respects.

Artificial intelligence has played an important role in the field

of computer-based learning systems to enable the movement of the learning process to produce tangible and measurable improvement in the learning process.

I. CREATIVE THINKING

Studying creative thinking start since 1950 by Guilford, by presented his model of the structure of the human mind, teams through between the two types of thinking: Convergent thinking, measured by traditional intelligence tests, and Divergent thinking, measured by creative thinking tests. Gilford pointed that the examination of IQ tests does not indicate the existence of any items that measure creativity, also called for the need to search beyond the intelligence to look for Creativity [1]. Gilford matrix model triple classification are:

- First after content:
- Second: After operations:
- Third: After outputs

Torrance theory defined creativity as [2]:

- Sensitivity to gaps and puzzling or missing elements.
- Formulate, test and deliver their findings.
- Ability to modify and re-test.

Torrance confirms the following:

- Creative personality characteristics, such as sensitivity to problems, and gaps in knowledge related to a particular topic.
- The creative process that has its steps beginning to feel the problem and look for evidence associated with it
- It should be borne in mind that the higher creative people fall into the following two groups:
 - People with average intelligence.
 - People with high intelligence

II. CREATIVE THINKING SKILLS

- Fluency:- Is the ability to produce as many creative ideas in a certain period of time.
- Flexibility:-Is the ability to quickly produce ideas that belong to different aspects and are related to a particular situation.
- Originality:-Is the uncommon production that no one has ever seen.
- Sensitivity of Problems :-And is the ability to recognize weaknesses or lack of dramatic position.
- Elaboration:-This creative ability involves providing multiple details of specific objects, such as broadening the idea of a summary or elaborating a vague theme.
- Preserving the direction: - It means the ability to focus with long-term attention to a particular goal [2].

III. THE DIFFERENCE BETWEEN THE (INTELLIGENT) AND TALENTED (CREATIVE)

There is agreement among the majority of scientists that individuals who are less intelligent than the average will not be creative, but individuals who are in the level of intelligence of ordinary or higher can be creative or not, and that determines their creativity or not is the availability of other personal and emotional factors Table (1) shown the difference between the intelligent and the talented[2].

TABLE 1: The Difference between the intelligent and talented

Talented	Intelligent
1. Ask questions	1. Know answers
2. His curiosity is intense	2. Interested in
3. A lot of playing with it gets a great score	3. Engages his attention
4. Inquire about the answers	4. Works hard and perseverance
5. prefer older or older than him	5. Answer the questions
6. Good guessing	
7. The length of the period,	

because he knows the answer	6. Enjoy with peers in age
8. The banner and feelings are strong	7. Good conservation
9. very critical of himself	8. Easy to learn
	9. Good listening

IV. E-LEARNING STRATEGY ACCORDING TO THE CHARACTERISTICS OF CREATIVE THINKING

Strategy is a plan that shows how to reach a specific goal. It refers to a complex network of ideas, experiences, expectations, goals, experience and memory that represent this plan so as to provide a general framework for a set of actions that reach a specific goal. Where’s a method is the mechanism and how to implement each of the actions required to implement the strategy based on a set of sources and tools [3].

The characteristics for creative person depends on measuring the following:

- Mental characteristics: (include sensitivity to deal with problems, fluency, flexibility, originality, intelligence).
- Psychological characteristics: (trust, strength, determination, tendencies, intolerance)
- Characteristics behavioral and social: (exploration, debate).

Figure (2) shows the appropriate strategy for each category and Table (2) shows the characteristics that cope with the appropriate learning strategy .

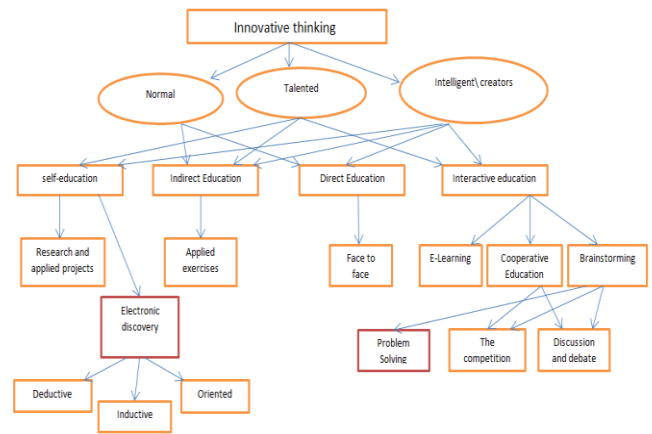


Fig. 2. appropriate strategies for each target group

TABLE2: The characteristics and the appropriate learning strategy

Self-education	Indirect education	Direct education	Interactive education	Attribute statement
✓			✓	Independence
✓			✓	Self confidence
✓	✓		✓	Adventure
✓		✓	✓	Strength and enthusiasm
			✓	Curiosity and wonder
✓			✓	Humor and play with ideas
✓			✓	Openness to experiences
		✓	✓	Strong will to face failure
			✓	Promptitude
			✓	Lead dye
✓	✓		✓	Eat things with a kind of fun
		✓	✓	Keep on doing whatever he is committed to
✓			✓	Diversity in ways of thinking, shows by dealing with the surrounding events
	✓		✓	Flexibility in thinking and giving multiple and strange alternatives to one idea
✓			✓	High sensitivity to the ocean
		✓	✓	Broad-minded in understanding and discussing philosophy
✓		✓	✓	After looking at the reasons for the predicament (problem)
✓			✓	Originality and creativity in thinking and finding ways to solve problems and the ability to find new inventions and liquid.
			✓	He has high linguistic skills
✓			✓	Complex and complex mental energy
✓			✓	For the sweet
✓	✓		✓	Creators enjoy a high level of self-reliance.
✓			✓	They cannot sleep for long and deep periods because of the constant work of their mind, and even when they are asleep.

As a result, through the analysis of these characteristics the personality is divided into four types as follows:

- o Smart talented personality
- o Personal gifted with intelligence
- o Normal character

o Poor personality

Thus, to determine what type of personality within these four types suit the e-learning strategies has to be developed and a questioner needed to be conducted based on the four models as shown in Table(3,4,5.6).

TABLE 3: The Mental Characteristics Model

Description	Strongly Disagree	I do not agree	I do not know	Agree	Strongly Agree
POSSESSING A WIDE AND DEEP KNOWLEDGE BACKGROUND IN VARIOUS SCIENTIFIC, LITERARY, LINGUISTIC, ARTISTIC AND READING AND READING FIELDS					✓
MY THINKING IS MORE FLEXIBLE THAN THE OTHERS AND GIVING MANY STRANGE ALTERNATIVES TO ONE IDEA					✓
MY CONCLUSIONS ARE MORE ACCURATE AND I COME TO THEM MORE QUICKLY THAN MOST PEOPLE AND I FIND WAYS TO SOLVE PROBLEMS AND THE ABILITY TO				✓	

VERSATILITY, CAPACITY AND KNOW-HOW

√

TABLE 4: The PSYCHOLOGICAL Characteristics Model

Description	Strongly Disagree	I do not agree	I do not know	Agree	Strongly Agree
I AM VERY CRITICAL OF MYSELF	√				✓
DO NOT LEAN TO RISK AND RISK					√
I DO NOT TEND TO JOY AND HUMOR				✓	√
I LOVE TRAVELING A LOT AND I LOVE CHANGING THE ROUTINE			√		✓

TABLE 5: The behavioral Characteristics Model

Description	Strongly Disagree	I do not agree	I do not know	Agree	Strongly Agree
ANSWER THE QUESTIONS DIRECTLY ACCORDING TO THE INFORMATION I KNOW					√
I DO NOT TEND TO WORK ALONE AND I DO NOT TEND TO ISOLATIONISM AND INTROVERSION	√				
WHEN I DISAGREE WITH OTHERS I AM LESS VIOLENT AND AGGRESSIVE				√	
I DO NOT INCLINATION INTO CHAOS AND LACK OF SYSTEM					√

TABLE 6: The social Characteristics Model

Description	Strongly Disagree	I do not agree	I do not know	Agree	Strongly Agree
DO NOT TEND TO SIT WITH ADULTS	√				✓
I LOVE EDUCATION BY A TEACHER UNDERSTANDING THE MATERIAL EVEN IF HIS BEHAVIOR IS NOT GOOD COMPARED TO OTHERS, I FIND MYSELF MORE INTERESTED IN SOCIAL RELATIONS AND THE DESIRE FOR SOCIAL INTERACTION				√	√
I'M THINKING OF LEAVING THE IMPRESSION ON OTHERS					√

The scores collected for positive questions as (2,1,0,-1, -2), and the scores for negative questions as (-2, -1,0,1,2). The student divided into four critters as in Table (7).

TABLE 7: the proposed matrix for talented and the suitable e-learning strategies

Critters	characteristics	Type personality	Strategy	Output(NN)
A	mental	Smart talented	Interactive learning	1
B	Psychological	The talented Medium	Self-education	2
C	Different	Normal	Indirect education	3
D		Weak	Direct education	4

I. SURVEY RESULT

Survey conducted and 180 questionnaire was distributed to a students, 40 of them from the preparatory school, 60 from the primary school, and 80 from the secondary school. The evaluation of the questionnaire was as follows:

- If the student has 3 or 4 points in the first form (mental characteristics), the student will consider intelligent NN output is (1), then the strategy is interactive learning and gain three points.

- If the student does not get three or four points in the mental form and gets (three or four) points in the second form (psychological characteristics), the student will be talented/gifted with the average IQ and the outputs is (2)..
- If the student did not get(Three or four) points in the first or in the second form and get (three or four) points in the third form (behavioral characteristics) the student will be normal and the outputs is (3) The strategy then is indirect education.

- If the student did not get any points in any of the form the student will consider Weak and the outputs will be (4) and strategy will be direct education.

Based on the research model to determine the characteristics of the student and propose the appropriate learning strategy. 20 out of 180 have been excluded due to uncertainty. The survey result as shown in Table (8,9), show that 25% of

the responses consider talented smart personality, and 28% were eligible for the talented personality. 36% normal personal and 11% are weak. 20 responses has been interviewed to make sure that the responses understand the questions clearly. The survey result succeed the ability accommodate the learner in appropriate e-learning strategy.

TABLE 8: Survey result

Exclude questionnaire	11% Personal weak	36% personal Normal	28% Personal talented Medium	25% Personal talented Smart	160 Number of students	School name
5	6	13	10	6	40	Al Tahrir School
5	7	20	14	14	60	El Falouga School
10	5	25	20	20	80	Ganzour Secondary School

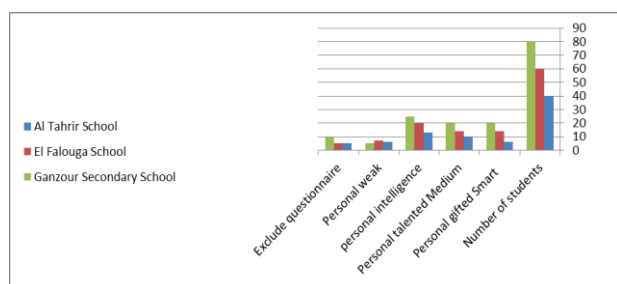


fig. 9. : Survey result 1

I. CONCLUSION

A questionnaire conducted and analyzed to determine the characteristics of talented and creative thinking student level to improve their ability in gaining the knowledge in shortest time. By developing a tool to propose the appropriate e-learning strategy and methods for individual learner. The questionnaire structure based on a proposed model consist of sixteen questions, four questions for mental characteristics, other four questions for psychological characteristics, behavioral and last four questions for social characteristics. The survey result succeed the ability accommodate the learner in appropriate e-learning strategy.

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