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Employing fuzzy logic in building a scale to reveal the creative traits of distinguished students

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Abstract

This research aims to employ fuzzy logic in building a scale to reveal the creative traits of distinguished students. The research sample consisted of (60) male and female teachers (34) males (26) females from all distinguished schools in Thi- Qar Governorate, two schools, Al-Karrar Secondary School for Distinguished and Secondary School of Al-Zahra for girls were chosen intentionally, due to the nature of the research, the researchers adopted the descriptive approach, to achieve the aims of the research, the researchers built a creative traits scale consisting of (54) items, the validity of the scale was verified and proven, (SPSS) was adopted to extract the results. The results were shown:

1. The use of fuzzy logic in building a scale to reveal the creative traits of distinguished students came largely.

2. There are statistical significant differences at the level of significance (α = 0.05) in the use of fuzzy logic among distinguished students according to gender, where the value of (t) (2.2) and statistical significance of (0.03) in favor of males with mean(2.85), while the mean for females (2.69).

In light of the results, the researcher recommends the following:

-Using fuzzy logic in different stages.

- Create an encouraged reward or an appreciation for distinguished teachers or create an annual competition for the ideal teacher in education, to help them to give continuously and create a spirit of competition among them.

- Conducting a field study on the use of fuzzy logic in other educational stages.

Keywords*: logic, hazy, scale, traits, creativity, students, distinguished.*

Chapter One

The Research Problem: A follower of the situation of education in Iraq finds that the development of creative traits in our schools has not received sufficient attention until the present time, as the teaching process is still dependent on a culture of memory, not a culture of creativity, and in this it still focuses in many aspects of the speech and instruction on the part of the teacher, memorization and listening from The learner side, where Taylor sees creativity as a threat to routine systems because it is a building and constructive force, as he plays an active role in aborting routine systems to make room for new systems characterized by vitality and vitality in important situations in society (Fakhro, 1994: 2).

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Creativity has become an important scientific research problem in a large number of countries. And increasing interest in the issue of creativity and creativity is not limited to developed countries only, nor to society without another, and education in Iraq is one of the important societies that needs great attention especially in the mental and creative side, where Simont and Bergson think that creativity is synonymous with life and development and cannot be overlooked or reduce its role in progress and development (Saleh, 1986: 133).

The fuzzy logic that generalizes classic logic by making other values between (0 -1), i.e. not limited to true and false, exists or does not exist, but it generalizes its existence in various degrees (Zadeh, 1965: P 331).

The researcher finds that revealing the traits of creativity among distinguished students in varying degrees is thus different from the classical logic that he sees whether or not, through the use of modern scientific methods and programs in its development. That a problem of research is trying to identify the traits of creativity using the scale that was prepared by the researcher and that was applied to a sample of distinguished students in the middle school.

This study can contribute to drawing the attention of interested and decision-makers to increase the interest of distinguished students by revealing their traits and creative capabilities as they are a distinct and important segment in a healthy society.

Recommendations of many conferences, seminars, and workshops held in the Arab world, including in Syria, are confirmed, starting with the first conference for developing education in 1987, through research and academic studies, including (Zahlouk, 1990), (Shabib, 2000), (Jaballah, 2010), and (Asaad, 2016) and a study (Al-Darwish, 2016), ending with the national workshop on curriculum requirements according to the standards entry held at the Faculty of Education at the University of Damascus (2014) that emphasized the importance of developing creative traits , and in the context of this the study seeks to investigate it by revealing the creative traits of students Distinguished people to ask the following questions:

1- Using fuzzy logic in building a scale to reveal the creative traits of distinguished students.

2- Are there statistical significant differences in the use of fuzzy logic among distinguished students due to the gender variable (male / female)?

The Research Importance:

The importance of the research stems from the studies that contribute to shedding light on the use of fuzzy logic in building a scale to reveal the creative traits of distinguished students in the Iraqi environment, and to provide scientific knowledge that will show the importance of the research from:

1. Trying to reveal a very important topic in the educational process, which is the use of fuzzy logic in building a scale to reveal the creative traits of distinguished students.

2. This research creates a scale to reveal the creative traits of distinguished students.

3. The research provides the officials in the educational process and the authors of the curricula with information about the use of fuzzy logic in the educational process to employ it more effectively in the educational process.

4. The study provides some information and suggestions for building a scale of creative traits and employing them in the educational process.

Research aims : The current research aims to:

1. Using fuzzy logic in building a scale to reveal the creative traits of distinguished students.

2. Are there statistical significant differences in the use of fuzzy logic among distinguished students due to the gender variable (male / female)?

The Research Limits And Limitations: The current search was limited to:

1. Human Limits: outstanding students in the fourth preparatory grade.

2. Time limits: for the academic year (2019/2020).

3. Spatial limits: Schools for distinguished students in the center of Thi- Qar Governorate.

4. Cognitive Limits: (fuzzy logic, creative traits of the distinguished).

The research determines its tool, its honesty, its reliability and the results obtained from it, and it is prepared by the researcher.

Defining terms: The researcher will define the following terms:

1- Fuzzy Logic was defined by:

- Saleh (2012): As the method by which the degree of affiliation or the degree of validity is determined, and it is the extent of the degrees between right and wrong, and this is the difference between it and the Boolean logic, which only knows right and wrong (Saleh, 2012: 4) .

- Farah (2014): As a generalization that enables us to achieve estimated conclusions, which are vague proposals from a set of inaccurate introductions, which are also vague proposals (Farah, 2014:).

The researcher knows it procedurally: it is a method used to conclude and judge between right and wrong through research between the grades (0-1) and give a decision towards the existing proposals.

2- Creative Traits:

Guilford defined creative traits: As open format thinking in which production is distinguished by a distinctive characteristic, and it is the variety of productive responses that are determined by the information given (Guilford, 1956: 127).

Zahlouk (2010): It does not indicate the capabilities that are characteristic of creative people, and the appearance of an individual who possesses the creativity of creative productions or not showing them depends on their natural characteristics, motivations and interests (Zehlouk and Abu Fakhr, 2010: 62).

The researcher knows it procedurally: it is the degree that distinguished students obtain through a set of characteristics and characteristics that distinguish them from their ordinary peers, and creative trait s include self-confidence, high energy, adventure spirit, and curiosity.

Distinguished students:

They are students studying in distinguished schools, and they were admitted to them on the basis of obtaining the highest totals in general exams for elementary education, as well as their success in performing two tests: the first to measure mental ability, and the second to test their achievement in some school subjects, and their acceptance is required that they not be Of those who failed or completed during their previous years of study (Ministry of Education, 1979: 6).

Chapter Two / Theoretical background and Related studies

This chapter includes the theoretical background and previous studies, and arranging them in chronological order.

First Part: Theoretical Aspect

Logic is a language: whoever speaks a pronunciation, and pronunciation is called outward pronouncement, which is speaking as in linguistics, and internal pronunciation is the awareness of colleges - as in the terminology of philosophers, and the science of logic is called logic because it strengthens the power of speaking in a person, because speaking is a statement of what is Stored in the mind, as well as defend him from the error in understanding and awareness of colleges (Mustafa and others, 1981: 22).

Logic as a term: Aristotle defined him as the tool of knowledge and its real object is science itself or is the image of science and this ancient perception of logic.

Fuzzy or cloudy logic is a system based on the generalization of traditional two-valued logic. In the narrow sense, it is theories and techniques that use foggy groups that are groups without definite boundaries unknown borders, unspecified or unclear (Abdullah, 2014: 2).

Fuzzy logic is logic that reflects the way people think. It gives examples of our feelings with the words we use and use, which enables us to give a closer picture of how these things are represented (Saleh, 2012: 4).

The Importance Of Fuzzy Logic:

The importance of fuzzy logic lies in two main aspects: the practical side, and the theoretical. It is an applied approach used to process data represented by mysterious and complex phenomena, and a theoretical logic concerned with the concepts represented by various fuzzy phenomena. These two sides are not separated from each other, but theoretical and applied overlap to form a total unity, and thus the fuzzy logic differs from the two-valued logic and the multi-valued logic that can be separated between these two sides (Sharaf, 2016: 52).

The idea of Fuzzy Logic stemmed mainly from the inability of conventional control systems (based on classic dual or multi-value logic) to represent mysterious and complex phenomena, or by their failure to take into account different fuzzy states. Contrary to classical logic, fuzzy logic is not only concerned with aspects related to the truth and falsehood of issues, or corruption and validity of inferences, but is also concerned with the treatment of those data related to phenomena (Al-Orfi, 2001: 191).

There is a group of reasons and motives that called on scientists to develop the fuzzy approach. With the development taking place in computers and software, the desire arose to invent or program systems that can deal with inaccurate information similar to human beings, but this generated a problem as the computer can only deal with accurate and specific data. This trend has resulted in what is known as expert systems or artificial intelligence and fuzzy logic is one of the theories through which systems can be built (Asaad, 2016: 42).

Traits Of Fuzzy Logic: One of the traits of fuzzy logic that he mentioned (Zadeh, L.A., 1989) are as follows:

1- Exact Reasoning is seen in fuzzy logic as a marginal case for Approximate Reasoning.

2- Everything in cloudy (fuzzy) logic is a matter of Matter Of Degree.

3- Knowledge in Fuzzy Logic is a set of Elastic Or Fuzzy Constraints based on a set of variables.

4 - Inference is seen as a process to generate flexible limitations (Zadeh, 1989).

The Concept Of Creativity:

Language: Creativity is a language that is derived from the verb (create) something, that is, invention, and creativity, which means extract and create it (Mustafa and others, 1981: 22).

Idiomatically: Abd al-Hamid, 1987 defined creativity as a process that indicates the presence of a certain set of traits, abilities, or factors that appear to influence the behavior of a creative person. A person is called a creator if he does not have these traits , or some of them with a very severe degree (Abdul Hamid, 1987: 18).

Distinguished students: I knew them (Al-Sous, 2009): They are students who are distinguished from their ordinary peers with high capabilities and skills as well as in tendencies and trends. The distinguished student usually gets a high rating in the academic subjects he / she is studying (Al-Sous, 2009: 29).

General Characteristics Of Distinguished Students:

1. Save and store an unusual amount of information.

2. Non-diverse interests and extraordinary curiosity.

3. Linguistic development and verbal ability of a high level.

4. Unusual sensitivity to other people's expectations and feelings.

5. Early development of the ability to control, internal control and satisfy needs.

6. Unusual input from the environment via a slender sensory system.

7. Early attention to intuitive knowledge and strange ideas.

8. The ability to predict and care for the future.

9. Creative touches in all fields of work or attempts.

10. Absorption speed (Clark, 1997: 69).

The School's Role In Caring For The Distinguished Student:

The school is the second environment after the family in which the student spends with his times of the day, hence the importance of the role the school plays in caring for the distinguished student, so everything that happens in the classroom and in every educational situation affects the student (Halawa, 2011: 84).

Academically distinguished students have distinct capabilities that make them fundamentally different from their regular peers, so there are their own pedagogical methods and programs that meet their unique needs that are not the same as the educational programs used with their ordinary peers. Distinguished students have special educational programs that differ from the goals of regular student programs, and this difference is In making the distinguished programs more enriching, whether these distinguished people in the regular classes or in special classes, while the other difference is to allow the distinguished students to accelerate the enrollment and completion of the school in less time than the ordinary students (Al-Khatib, 2011: 43).

Part Two: Related Studies

This part deals with a review of previous studies that are related to the subject of the study, and were arranged according to chronological order from oldest to most recent:

1- Amer study (2003) Effect of awareness of creative processes and creative style in the efficiency of problem solving:

This study took place at the Faculty of Arts at Cairo University, and aimed to know the effect of both awareness of creative processes and creative cognitive style in the efficiency of problem-solving, and the extent of ambiguity between the concepts of creative style and awareness of creative processes, and knowledge of the impact of creative competence in solving problems, and are there any significant differences between Highly experienced and less experienced in the efficiency of their creative solution. The research sample consisted of (418) male and female students, (166) of whom were male, at a rate of (40%) and (252) male and female, at a rate of (60%). The sample was drawn from three Egyptian universities, Cairo, Ain Shams, Helwan and from seven scientific departments The study tools consisted of three batteries for psychological tests: general awareness of the processes of creative problem solving, creative style, and the efficiency of problem solving or tasks. According to the sincerity of the content and the training, the reliability was extracted by the two methods of re-testing and estimating the Cronbach's alpha equation, and I found that there are statistical significant differences at the level (0,01) between the creative method and the total degree of creative competence to solve the problem, with a correlation between the creative method and most qualitative variables of creative efficiency, Then there is a statistical significant correlation at the level (0,01) between the creative method and the overall degree of creative competence to solve the problem of weak construction, within the group of high creative awareness, and finally there are significant differences between high awareness and low awareness in creative competence to solve weakly constructed problems. (Amer, 2003).

2- Miller Study (2009) Cognitive Processes Associated with Creativity: Scale Development and Process Validation:

This study took place at the College of Graduate Studies in Mons Indiana - in America, and this study aimed to know the level of cognitive processes related to creativity (CPAC) in its sub-aspects (incubation, adoption of multiple perspectives, standard or metaphorical thinking, brainstorming, mental perception, flow) Ideas), and knowledge of the relationship of cognitive processes related to creativity to some personal traits and creative product. The sample of the study consisted of (226) male and female students, (57) of whom were male and (169) male and female students from the Department of Educational Psychology. The study was conducted via the Internet, and the researcher used the statistical package (SPSS). The study showed high levels of students 'scores in the scale of cognitive processes related to creativity in all its sub-aspects, and the absence of a correlation to the cognitive processes associated with creativity with some demographic variables such as social desire, self-control, and academic achievement, and a significant correlation when Level (0.05) between the scale of cognitive processes and its relationship to the productive process (Miller, 2009).

3- Study of (Jaballah, 2010) The approach of cloudy logic and its applications in artificial intelligence The study was conducted at Cairo University / College of Arts - Department of Philosophy, the study aimed to identify the theoretical frameworks of fuzzy logic and did fuzzy logic overcome the problem of logical paradoxes unlike logic Classical, and does fuzzy logic go in the same direction as classical logic, or has it set a path other than the usual in classical logic, and fuzzy logic is a revolution on classical logic and what are the applied dimensions of fuzzy logic in the field of artificial intelligence, and the results of this study were to identify the applications of fuzzy logic In artificial intelligence and a statement of ways to use fuzzy logic in the field of artificial intelligence and a statement of the most important areas of basic artificial intelligence and its relationship to fuzzy logic as has been identified what is artificial intelligence (Jaballah, 2010)

4- Swelem Study (2015) The level of creative thinking among gifted students in the secondary stage in the Tabuk region in the Kingdom of Saudi Arabia in the light of some variables The study aimed to identify the level of creative thinking among gifted students in the Tabuk region in the Kingdom of Saudi Arabia in the light of some variables, The creative thinking scale was used, and the sample consisted of (82) students, 94 students with a total of (176) students, and the results of the study were that gifted students in the Tabuk region had an mean level of creative thinking, and the overall female performance on creative thinking skills is higher than the level of performance Males, and students of the third year of secondary school, had the highest levels of performance on the scale of creative thinking, and that there was a difference in the level of creative thinking among females and males in the different grade levels in favor of females (Swelem, 2015).

5- Study of (Asaad, 2016) A suggested model for measuring the degree of talent using fuzzy logic - an applied study This study took place at the Faculty of Science / Tishreen University in Syria, and this study aims to suggest a model for measuring the degree of creativity and talent among graduate students using one of the intelligence techniques The industrial is represented by fuzzy logic, and aims to demonstrate methods for measuring the degree of talent of graduate students according to the current educational system, and to find a proposed model for measuring the degree of creativity and talent of graduate students, and to indicate the degree of applicability of the proposed model, and the descriptive approach was used in addition to the analytical inductive approach With the aim of describing the study community and sample as well as examining the study hypotheses, the study sample was represented by graduate students (Master students in the Faculty of Science / Tishreen University) and among the results of the study is the possibility of applying the proposed model to all graduate students (masters) in Syrian universities, which helps in choosing Students holding a master's degree to register for a doctorate degree by relying on the degree of their talent and creativity, and not just by relying on an exam degree The Master's students (Asaad, 2016).

Comparing Related Studies With The Current Study:

The researcher reviewed many previous studies that focused on two axes, that most studies focused on fuzzy logic and another on creative trait s, and with varying proportions from one study to another, so the researcher benefited from previous studies in identifying or formulating the problem and its questions and defining its areas and tools to appear as it is now.

This research agreed with previous studies in terms of the methodology of the study, as it adopted the descriptive approach and differed that it applied to distinguished students.

And the advantage of this study is that it is the first study conducted in Iraq - according to the researcher's knowledge - using fuzzy logic in building a scale to reveal the creative trait s of distinguished students.

Chapter Three / Research Methodology And Procedures

Method and procedures: The aim of this research was to employ fuzzy logic in building a scale to reveal the creative traits of distinguished students, and this chapter examined a detailed presentation of the study community, its sample, its tools, methods of verifying its reliability and sincerity, its procedures, its variables, and the statistical treatments that were used in reaching Results.

Research Methodology: The current research relied on the descriptive approach, which is based on collecting data and answering its questions, as the use of fuzzy logic was used in building a scale to reveal the creative traits of distinguished students.

Research Community: The research community consisted of all distinguished schools in Thi- Qar Governorate, with two schools, Al-Karrar Secondary School for Distinguished Persons, and Al-Zahra'a Secondary School for Distinguished Girls, in Directorate of Education of Thi- Qar Governorate, who are (60) teachers males and females for the second semester (2019-2020) according to statistics of Thi- Qar Education Directorate According to the following schedule:

School	N	Percentage
Al-Karrar Secondary For Distinguished boys	34	56.6
Al-Zahra'a Secondary For Distinguished girls	26	43.3
Total	60	٪100

The Research Sample: The studied community includes a sample of distinguished school teachers in the city of Al-Nasiriyah, and the total of teachers reached (60) teachers and schools. The sample was chosen through the comprehensive survey of the research community

Table (1) shows the distribution of iterations and percentages of the respondents according to gender variables (N = 60)

Variable	Level	Frequency	Percentage
Gender	Male	34	%56.6
	Female	26	%43.3
	Total	60	%100

The Research Tool: To achieve the goals of the research and answer its questions, the researcher has built a scale of traits to collect data according to the research problem, goals, and questions, depending on its preparation on the following steps:

1. Access to educational literature and past studies.

2. Conducting personal interviews with a number of specialists in the educational field and asking them about designing the best and most appropriate scale for the research topic.

3. The scale of traits consisted of two parts: the first: demographic information for the research sample, and the second: the scale that expresses the directions of employing fuzzy logic in building a scale to reveal the creative traits of distinguished students. The scale consisted of (54) items in its primary form.

Validity Of The Search Tool: To verify the validity of the tool, the following steps have been taken:

1. Presenting the scale consisting of (35) items to a group of arbitrators from the faculty members in the specialization of general teaching methods, psychology, measurement and evaluation.

2. The researcher asked the arbitrators to express their opinion on the affiliation of the items of the scale to measure the trait to be measured, and to judge it from an amendment, deletion or addition, and after the result of the arbitration process, the required amendments were made, and the scale settled in its final form on (30) items.

The Tool Reliability: To verify the reliability of the scale and the reliability of its application, test-retest method was used by applying it to a exploratory sample consisting of (12) teachers and from outside the study sample twice with a two-week time difference, and extracting the correlation coefficient using the Pearson correlation coefficient (Pearson Correlation) between their two times estimates on the study tool in general, and the correlation coefficient between the two applications was (0.83), which is a statistical significant value at the level of significance ($\alpha = 0.05$).

Cronbach's alpha equation was applied to all items of the study tool, and Table (2) shows that the reliability factor, and the Pearson correlation coefficient of the tool in general, as it appears from the table that the reliability factor of the general tool reached (0.80), which is high and acceptable value for the purposes of Application.

Table (2) Reliability Coefficient (Cronbach's Alpha) and (Reliability) Pearson Correlation Coefficient for the Study Tool

	Value
Items Number	54
Cronbach's Alpha	0.80
Pearson Correlation Coefficient	*0.83

* Statistical significant at the significance level (= α 0.05).

Procedures For Implementing The Study Tool: After the scale has been adopted in its final form, and to achieve the objectives of the study, the following steps have been adopted:

1- Reviewing the theoretical literature and previous studies, then preparing the scale in its primary form consisting of (55) items, and the scale was presented to a committee of arbitrators in Iraqi universities to verify its authenticity, and then it consisted of its final form of (30) items.

2- Obtaining an important facilitation letter from the Thi- Qar Education Directorate to the relevant authorities regarding facilitating the researcher's mission.

3- The researcher distributed the scale of traits to the study sample consisting of (60) male and female teachers in Thi- Qar education, the method of answering was clarified, and all the information related to the scale and the goal of conducting the study were clarified, and the necessity of answering all items without leaving any one of them.

4- The researcher collected the responses of male and female teachers, and checked them to verify their suitability for statistical analysis, and classify them according to their variables. After completion I entered into the computer, and used (SPSS) to extract the results.

Study Variables:

First: The Independent Variables: Gender: It has two levels (male and female).

Second: Dependent Variables: Creative traits of the distinguished students.

Statistical Treatments: The following statistical methods were used:

1. Pearson correlation coefficient (re-reliability factor) to calculate application reliability.

2. The internal consistency factor (Cronbach's Alpha) to verify the reliability of the study tool.

3. Mean and standard deviations

4. Applying Independent Samples (t-test) to identify the differences between the answers of the individuals of the sample according to the gender variable.

Chapter Four / Presenting The Results

This chapter includes a presentation of the research results that aimed to employ fuzzy logic in building a scale to reveal the creative traits of distinguished students, as follows:

Results related to the first question: Using fuzzy logic in building a scale to reveal the creative traits of distinguished students. ?

To answer this question, the means and the standard deviations for the responses of the study members were calculated on the items of the scale, table (3) shows that.

Table (3) Means and standard deviations of response of the study members about items of attitude scale in descending order

Order	No.	Item	Mean	Std. Deviation	Trait Level
1	7	Not afraid to solve big problems.	3.03	0.35	High

Order	No.	Item	Mean	Std. Deviation	Trait Level
2	3	Highly alert.	3.02	0.36	High
2	2	He criticizes himself and his colleagues objectively.	3.02	0.37	High
3	4	He has continuous activity.	3.01	0.31	High
4	1	He is accurate and objective.	2.90	0.29	High
4	33	He is highly sensitive to science and knowledge.	2.90	0.33	High
5	34	His ability to design his ideas.	2.89	0.32	High
5	5	Its performance is steadily outstanding.	2.89	0.33	High
6	36	He shall adhere to the tasks assigned to him.	2.85	0.35	High
6	38	Distinguished in all subjects.	2.85	0.36	High
7	51	He has a high level of self-confidence.	2.84	0.36	High
7	35	Committed to perseverance, persistence and strength of determination.	2.84	0.37	High
8	50	Keen in performing his duties.	2.78	0.42	High
8	37	He has emotional balance and restraint.	2.78	0.41	High
9	6	He does not give up his vision easily.	2.76	0.43	High
9	18	He has a high energy to study.	2.76	0.41	High
9	19	Characterized by curiosity and curiosity.	2.76	0.42	High
10	21	Loves to be unfamiliar.	2.74	0.45	High
11	20	His insight is high in linking cause and effect.	2.73	0.44	High
11	49	His questions are controversial.	2.73	0.43	High
12	23	He has great imagination.	2.72	0.40	High
13	39	Prudent, alert and cautious.	2.71	0.41	High

Order	No.	Item	Mean	Std. Deviation	Trait Level
13	22	Has linguistic fluency.	2.71	0.42	High
13	30	He has independence in thinking.	2.71	0.45	High
14	10	He is logical and proof-based.	2.69	0.44	High
15	32	His ability to intuition and foresight is great.	2.68	0.43	High
16	31	His talents and interests are multiple.	2.67	0.40	High
17	9	Loves fun and humor.	2.65	0.41	High
18	24	Has the ability to manipulate ideas.	2.64	0.42	High
18	40	Shows his ability to perceive problems.	2.64	0.45	High
19	48	Has good social relationships with colleagues.	2.63	0.44	High
19	41	He has seriousness, honesty and sincerity.	2.63	0.43	High
20	8	He studies with great enthusiasm.	2.62	0.40	High
21	15	He has accurate organization of his time.	2.60	0.41	High
21	25	Not adopting stereotypes.	2.60	0.42	High
21	29	Accomplishes his duties with determination and high diligence.	2.60	0.45	High
22	14	Solve problems in more ways than one.	2.61	0.44	High
22	28	He loves to explore unknown things.	2.61	0.43	High
22	16	Tends to search for details and relationships.	2.61	0.40	High
22	46	He takes his positions with intuitive speed.	2.61	0.41	High
22	17	Examines and evaluates ideas.	2.61	0.42	High
22	27	He does not care about the difficult tasks.	2.61	0.45	High
22	47	He has good listening and	2.61	0.44	High

Order	No.	Item	Mean	Std. Deviation	Trait Level
		communicating with others.			
23	13	Has strong memory and fast learning.	2.55	0.34	High
24	26	He tries to present his ideas to others without hesitation.	2.54	0.41	High
25	43	He depends on himself in facing academic challenges.	2.54	0.42	High
26	44	He has psychological self-development.	2.53	0.45	High
27	11	He accepts his colleagues' ideas with an open mind.	2.52	0.44	High
28	45	He has ability to pay attention and focus.	2.50	0.43	High
29	42	Interested in new ideas.	2.48	0.40	High
30	12	He seeks to know the views of his colleagues and shares their views.	2.41	0.76	High
		Scale	2.78	0.20	High

* (N = 60)

Table (3) shows that the mean for the study members responses to the items of employing fuzzy logic in building a scale to reveal the creative traits of distinguished students. It ranged between (3.03-2.41) with a high rating for all items, the highest of which was for item (7) He is not afraid to address big problems, while the lowest for item (12) seeks to know the views of his colleagues and shares their opinion, with an mean (2.41) , Standard deviation (0.76), with high attributes

Results related to the second question: **Are there statistical significant differences in the use of fuzzy logic among distinguished students due to the gender variable (male / female)?**

To answer this question, Independent Samples (t-test) used on the scale as a whole according to the gender variable, tables (4) explain this.

Table (4) Results of the application of (Independent Samples t-test) to examine the differences between the means of the responses of the study members on the scale of trends according to the gender variable

Gender	Mean	Std. Deviation	t.test	Significance
Male	2.85	0.18	2.25	0.03
Female	2.69	0.14		

Table (4) shows that there are statistical significant differences at the level of significance ($\alpha = 0.05$) in the use of fuzzy logic among distinguished students according to gender, where the value of (t) (2.2) and statistical significance of (0.03) is a significant value Statistical in favor of males with a mean (2.85), while the female mean (2.69).

Chapter Five / Interpretation Of The Results

This chapter includes discussion of the research results based on the research questions that aim to employ fuzzy logic in building a scale to reveal the creative traits of distinguished students. It also includes the most important conclusions, recommendations and proposals reached by the research:

Discussing the results related to the first question: Using fuzzy logic in building a scale to reveal the creative traits of distinguished students?

The results of research related to the use of fuzzy logic in building a scale to reveal the creative traits of distinguished students showed that the mean for the responses of the study members on the items of employment of fuzzy logic in building a scale to reveal the creative traits of distinguished students. It ranged between (3.03-2.41) with a high rating for all items, the highest of which was for item (7) He is not afraid to address big problems, while the lowest for item (12) seeks to know the views of his colleagues and shares their opinion, with an mean (2.41) , Standard deviation (0.76), with high attributes

The researcher may attribute this result to the change in the role of the teacher in the recent period; As he became giving great attention to the creative traits in his hands, his effect on the educational process was reflected.

The researcher may attribute this result to the awareness of male and female teachers about the active role played by learning according to traits, and they deal with them in a patriarchal role. Taking into account the individual differences between the learners, energizing and attracting them by unconventional methods.

Discussion of the results related to the second question: **Are there statistical significant differences in the use of fuzzy logic among distinguished students due to the gender variable (male / female)?**

The results showed that there are statistical significant differences at the level of significance ($\alpha = 0.05$) in the use of fuzzy logic among distinguished students according to gender, where the value of (T) (T) (2.25) and a statistical significance of (0.03) which is statistical significant value in favor of males with mean(2.85), while the mean for females (2.69).

The researcher may attribute this result to the fact that teachers are more capable of employing fuzzy logic and their constant eagerness to develop and use all that is new and innovative, and as a result of trying to renew and care for distinguished students and their constant motivation.

Perhaps the reason is that the teachers have the ability and initiative to initiate, and as a result, the females in a conservative society impose some restrictions as a result of customs and the local tribal community that maintains many things and finds that there are constants that should not be overcome or worked upon.

Conclusions

In light of the researcher's findings by applying the study tool, the following was concluded:

1. Using fuzzy logic in building a scale to reveal the creative traits of distinguished students came largely.

2. There are statistical significant differences at the level of significance ($\alpha = 0.05$) in the use of fuzzy logic among distinguished students according to gender, where the value of (t) (2.2) and statistical significance of (0.03) is a statistical significant value in favor of males with mean(2.85), while the mean for females (2.69).

Recommendations

In light of the results, the researcher recommends the following:

1. Using fuzzy logic in the different stage.

2. Make an incentive bonus or an appreciation book for an outstanding teacher or create an annual competition for the ideal teacher in education, in order to help them to give continuously and create a spirit of competition among them.

3. Conducting a field study on using fuzzy logic in other educational stages.

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