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The effectiveness of the six thinking hats strategy for teaching the curriculum and teaching methods course in developing creative thinking skills and achievement among students of the Faculty of Education at the University of Tikrit

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Abstract:

This study aims to determine the effectiveness of the six thinking hats teaching strategy and teaching methods in developing creative thinking skills, which include five skills (fluency, originality, flexibility, sensitivity to problems, elaboration or detail) and then propose a treatment plan. A semi-experimental method was used. The research sample was represented by third-year psychology students in the School of Education and divided into two groups. Each group included (15) male and female students, and the exploratory group included second-year students of the same major, a total of (30) students and one student. The six thinking hats strategy was used for teaching, and the psychology students in the control and control groups were tested before and after the measurement. The mean score of the experimental group students in the pre-test was (70.07) with a standard deviation of (4.65), while the overall mean score of the experimental group students was (112.67) and (112.67). The standard deviation is (5.84), and the (T) test showed a significant difference (T = -22.1), and the significance level is 0.05, which is statistically significant. The study also showed that the mean score of the students in the experimental group for the pre-test was (48.53) with a standard deviation of (6.52) and the (T-test showed a difference in favour of the post-test as compared to the pre-test. -The measurement of the experimental group emphasized the effectiveness of applying the six thinking hats strategy and its importance in university education .

Keywords: Thinking about strategy, curriculum and teaching methods, students of the College of Education.

Introduction

Teaching creative thinking and developing academic performance skills is a key goal of higher education, as universities play a key role in preparing students to become creative leaders and thinkers in various fields, especially psychology. One of the innovative educational strategies proven to be effective in promoting creative thinking and academic achievement is the Six Thinking Hats strategy developed by Edward de Bono. The Six Thinking Hats strategy is an educational tool that stimulates diverse and organized thinking by dividing the thinking process into six different modes, each symbolized by a coloured hat. These modes include analytical, creative, critical, emotional, proactive, and organizational thinking. The tremendous explosion of knowledge in all walks of life and the development of various fields require the educational system to process knowledge in new forms and go beyond the lowest level of mental skills, such as memorization, to develop students' means, methods and strategies for thinking and ability. Creative thinking ability and apply it to all aspects of life. Therefore, the development of mental abilities has become a major goal of the educational process in countries around the world, as the progress of a country is measured by its ability to develop children's minds (Al-Haila, 2001). Piaget believed that the main goal of education is to develop individuals who can do new things rather than repeat what their predecessors did. In contrast, Guilford believed creativity is the key to education in the broadest sense and becomes the key to solving the most stubborn problems. This requires breaking away from the normative framework in rewriting and transferring knowledge to add something new and useful (Nevin Al-Barakani, 2005). Therefore, modern education is committed to developing learner thinking and regards it as the primary educational goal. This is one of the main goals that all disciplines strive for today. This includes teaching learners to organize ideas and information, work hard to solve problems and develop various forms of thinking, including convergent and divergent, deductive, critical, creative, analytical, and synthetic (Allawi, 2015).

Therefore, modern education is committed to the development of learner thinking and regards it as one of the primary goals of education. Modern teaching strategies, including the Six Hats teaching strategy, are among the most important for improving cognitive abilities. One of the most famous strategies is the Six Hats teaching strategy, proposed by one of the pioneers in the field of thinking (Edward de Bono). In summary, it can be summed up that a person is trained to think in a certain way and then moves to a different way of thinking depending on the colour of the hat. It is important to note that these hats are not real hats worn by people but psychological hats that symbolize a certain way of thinking. Each hat has a certain meaning (Edward Debono, 2013). This strategy can help students analyze problems from multiple perspectives, develop innovative solutions, and make wise decisions. Given the current teaching challenges, this study explored the effectiveness of applying the six thinking hats strategy in the curriculum and teaching methods of the Faculty of Education at the University of Tikrit. The study aimed to measure the strategy's impact on cultivating creative thinking skills and improving students' academic performance.

The first topic: research methodology

First: the research problem

In higher education, there is a growing need to develop effective educational strategies that promote the development of creative thinking skills and cognitive performance among students. Creative thinking skills are considered to be one of the essential skills that students need to meet the challenges of today's world. Using the six thinking hats strategy, students can adopt different and diverse ways of thinking, improving their stereotypical thinking skills and ability to develop innovative ideas and solutions. This way of thinking is necessary not only in academics but also in professional and personal life, as well as in developing creative thinking skills. In response to this issue, this study attempts to answer the following main questions: How effective is the six thinking hats teaching strategy in curriculum and teaching methods in developing creative thinking skills and cognitive performance among students of the Faculty of Education at Tikrit University?

Second: The importance of research

The importance of the study is reflected in the following points:

1. The importance of the study is that it is a response to the modern trends in the education system, especially in higher education, which aims to use modern strategies in teaching, and the benefits are as follows:
2. This study provides a model for teaching the six thinking hats strategy, which can guide the formulation of teaching strategies in higher education institutions.
3. It can provide them with a teaching guide through modern strategies (six thinking hats) that they can follow, improving their course teaching performance and achieving the desired goals.

4. The study provides a teaching strategy that allows students to think about the same topic from different perspectives, which helps them develop better creative thinking skills and cognitive performance.
5. It helps provide suggestions and recommendations that may be useful in higher education in general and in developing thinking skills in particular.

Third: Research Objectives

The research objectives are as follows:

1. To demonstrate the effect of the six thinking hats strategy teaching on the development of creative thinking skills of students in the Faculty of Education, Tikrit University.
2. To demonstrate the effect of teaching the six thinking hats strategy on the development of cognitive performance scores of students in the Faculty of Education, Tikrit University.

Fourth: Research hypothesis

Based on the above, the hypotheses of the study can be summarized as follows:

First hypothesis:

After the creative thinking ability test of the students in the experimental group, the average scores of the students in the experimental group and the students in the control group were significantly different.

Second hypothesis:

There was a statistically significant difference in the mean scores of the students in the experimental group on the creative thinking ability test before and after the application, favouring the students in the post-application group.

Fifth: Research Methodology

The descriptive method determined the creative thinking skills required by the Faculty of Education at Tikrit University students. The experimental method involved teaching units (curriculum elements) using the six thinking hats strategy, a modern strategy that was presented and demonstrated to be effective in developing students' creative thinking skills and cognitive performance.

Sixth: Research Community and Sample

Research Community

It includes all students of the Faculty of Education at the University of Tikrit for the academic year 2024, including all students at four levels (from first to fourth).

Study Sample

A random sample was drawn from the research population, represented by the third-term psychology students, consisting of 30 male and female students. The research sample was divided into the control group of 15 male and female students and the experimental group of 15 male and female students. The survey sample was the second-term students, of which there were 30 male and female students.

The second topic: search terms

First: Search Terms

The Six Hats:

De Bono defines it as a thinking activity in which the human view of things is expanded to include a variety of different thinking modes, from positive or negative thinking, creative or constructive thinking, etc., using symbolic language and organizational structures to adapt to help the thinker organize his thinking activities. (Edward De Bono, 2013). It is also known as one of the modern thinking programs developed by Dr. De Bono, which is an effective thinking tool to promote parallel thinking. Alternatively, it is a training program that provides recipients with knowledge and skills they can use and benefit from, promoting creativity and developing personal abilities. (Fahim Mustafa, 2007). It is also defined as a conscious thinking system that guides an individual's thinking in a certain direction (MevlüdeKarada ğ, 2007).

The thinking methods represented by the six thinking hats:

The six thinking hats mentioned by De Bono represent different ways of thinking:

- Think neutrally (white hat).

- Think in a positive way (yellow hat).
- Think creatively (green hat).
- Think critically and pessimistically (black hat).
- Think in an emotional way (red hat).
- Thinking thinking (blue hat).

Six types of hats and their colour meanings:

1. White hat thinking (neutral thinking) relies on facts and statistics. It is important to distinguish between facts and realism; people think it is necessary and existential.
2. Red hat thinking (emotional thinking), where the emotional aspect is in the foreground, not the logical aspect because feelings and emotions constitute the background that affects reality. Therefore, if we know them, we can reduce the negative aspects that affect us by controlling them and benefiting from their positive aspects.
3. Black hat thinking (negative thinking): This is where the negative aspects of the subject are exposed. This is critical thinking, but it must be based on logical reasons and reasons.
4. Yellow-hat thinking (productive, positive) is optimistic and ambitious, the opposite of black-hat thinking. It emphasises the positive aspects of thinking and provides a picture of the future, but it needs to be cautious so that the mind cannot interpret it in a dream but only give logical reasons.
5. Green hat thinking (creative thinking) provides a variety of alternatives and new ideas that match our potential and meet our needs. This type focuses on the targeted development of creativity.
6. Blue Hat Thinking (Holistic Thinking) is a regulator, mentor, and guide. It controls the direction of the previous five types of thinking, determines which type has an advantage, and teaches when to switch from one type to another. (Hamad Al-Omran and Munira Al-Sallal, 2009) (Mandour Abdel Salam, 2008) (De Bono, 2013).

The main purposes of using the six hats:

It provides a set of basic goals for thinking using the six hats, as follows:

Defining roles: One of the obstacles to thinking is the defence of the self, which is responsible for most practical reasoning errors. Therefore, the hat allows us to think and express our opinions without hurting them. Wearing the clown costume allows you to play his role, thus freeing the individual from linear thinking in a single direction; different ways of thinking replace it. - Directed attention: focusing on multiple perspectives on the issue being discussed, thereby increasing the individual's perspective and forming six different perspectives on the issue.

Relevance and setting rules for thinking: If the coding method allows the hat to transfer and transform ideas, such as B. Is it creative and can think by allowing the thinker to deal with one problem at a time?

Effective organization of information and activities: through the possibility of controlling brain chemistry that affects our psychological moods, where the use of parallel thinking of the six hats to modify the balance of water cauterisation, when different types of thinking are used, so that one type does not control another.

Stop being pessimistic and look for the positives.

Creative thinking

The ability to deal with vague or unspecified problems comfortably, to find new and original approaches, and to try new methods (Al-Quds Open University, 1997). It is also defined as a way of thinking that requires individual potential and a social and psychological atmosphere, producing behaviour with specific norms (Hassan et al., 2003).

Elements of creative thinking:

The following items can be displayed:

1. Creativity process: This process requires learners to perform activities to find solutions to problems in a given situation by identifying problems, generating hypotheses, and testing the validity of the hypotheses.
2. Creative performance: This is the process by which learners rearrange their experiences to produce something new that is unknown and correct under certain criteria.
3. Creative environment: This is the community that surrounds the learner and provides him with appropriate opportunities to promote creativity. (Walid Sawafta, 2008).

Creative thinking skills

Most educators and many studies and research agree on this, including the study by (Afif et al., 2007), the study by (Yasser et al., 2006), the study by (Samir Al-Absi, 2005) and the study by (Mohamed et al., 2004) which divides creativity skills into five skills (fluency, originality, flexibility, problem sensitivity, elaboration).

Fluency:

It is the ability to generate the maximum number of alternatives, ideas, and questions in response to a given stimulus at a given time. (Mohammad Nofar, 2009).

Flexibility:

Flexibility is the ability to change your mindset by changing your attitude. It is the opposite of mental rigidity, where a person tends to adopt certain thinking patterns when faced with different and uncertain situations (Supervisory Disclosure, 2005).

Originality: The difference between originality and flexibility is not an individual's unwillingness to repeat his or her ideas, as flexibility does, but the unwillingness to repeat the results that others have achieved (Khalil et al., 2000).

Creating and optimising search tools:

First: From the perspective of experts and specialists, a list of creative thinking skills required by students of the Faculty of Education at the University of Tikrit, Iraq, was developed through observation:

Undergraduate training goals.

Literature is used to teach and develop thinking skills in general and creative thinking in particular.

Previous studies and research related to the research topic. These skills have been identified in a preliminary list that is being prepared.

It is intended to be presented to a panel of judges and contains five skills, which include (29) sub-skills as follows:

Fluency skills, which include (5) five sub-skills.

Resilience skills, which include (7) seven sub-skills.

Creativity skills, which include (7) seven sub-skills.

Problem sensitivity skills, which include (5) seven sub-skills.

Efadh skills, which include (5) seven sub-skills.

To check the validity of the list, it was submitted to a panel of six (6) eight judges, of whom four specialized in curriculum and teaching methods and two in psychology.

Second: Building the Creative Thinking Test:

The test is divided into the following steps:

A—Purpose of the Test: The test is designed to measure the level of creative thinking skills of students of the Faculty of Education of Tikrit University before and after the unit prepared in the teaching (Course Elements) through the six thinking strategies. The purpose is to show whether the teaching is effective in developing these skills in students.

B- Original picture of the test: The test was formulated in its original form, including some instructions, its purpose and the data required from the students, and the following factors were considered during its preparation:

When formulating the questions, the focus was on measuring the creative thinking skills listed in the skills list.

The test vocabulary was formulated in clear, simple language and with clear vocabulary. The test consists of (35) questions measuring specific sub-skills such as fluency, originality, flexibility, problem sensitivity and elaboration, which are all included in the creative thinking skills list.

The third topic: the practical side

Test Stability:

The test was applied to an exploratory sample outside the research sample, represented by psychology students in the second phase, where stability was calculated in two ways: the first was the Cronbach alpha method, and the second used the half-split method the number of questions for each creative thinking skill was unevenly divided (the number of questions was an odd number). The correlation coefficient was inserted into the Spearman-Brown semi-hierarchical correction equation, as shown in Table (1).

Table (1): Creative thinking ability stability coefficient

Skill	Number of questions	Stability method	
		Cronbach's alpha < 0.7	Half Hash < 0.7
Fluency	7	0.810	0.789
Originality	7	0.871	0.786
Flexibility	7	0.829	0.872
Sensitivity to problems	7	0.729	0.852
Details	7	0.869	0.874
Total	35	0.816	0.824

From the results in Table (1), we can see that the stability coefficients of the five creative thinking skills exceed 0.7, and the overall stability coefficient of the test with 35 questions reaches 0.816, corresponding to a value above 0.7. The stability coefficient shows that the half-split method exceeds 0.7 in each creative thinking skill, and the overall stability coefficient reaches 0.824, which exceeds 0.7. This result confirms that the test has acceptable stability.

Building the prescribed unit:

The unit includes the following:

1. 1. Unit reference (Introduction to Six Thinking Hats, Guidelines for Using Six Thinking Hats, Teaching with Six Hats, Principles and Guidelines for Successful Teaching with the Strategy, General and Specific Objectives, Teaching Resources and Activities, Assessment Methods, Timeline, List of some References used).
2. 2. The teaching unit includes the expected number of hours, which includes 12 lectures over 6 weeks.

Equivalence test of the two groups (control & experimental)

The equivalence of the two groups (15 students each) was tested by pre-testing the two groups twice before teaching using the six hats strategy and comparing their performance results in this application with the results of To. After comparing the applications, Table (2) shows that.

Table (2): Difference in mean scores of students in the control and experimental groups in tribal applications (n = 15)

Skill	The Collection	Arithmetic mean	Standard deviation	Value of t	P-value	Significance level
Fluency	Adjuster	9.53	1.88	-0.091	0.928	Non D
	Experimental	9.6	2.13			
Originality	Adjuster	8.13	1.92	-2.165	0.039	Non D
	Experimental	9.73	2.12			
Flexibility	Adjuster	9.4	2.85	-1.134	0.266	Non D
	Experimental	10.4	1.88			
Sensitivity to problems	Adjuster	9.6	2.06	0.599	0.554	Non D
	Experimental	9.13	2.2			
Elaboration (details)	Adjuster	9.2	2.01	-0.613	0.545	Non D
	Experimental	9.67	2.16			
Total Grade	Adjuster	45.87	5.11	-1.246	0.223	Non D
	Experimental	48.53	6.52			

The results in Table (2) show that there is no statistically significant difference in the mean test scores of the psychology students in the control group and the experimental group at each creative thinking skill level in the pretest, because the probability value is greater than the moral value of 0.05, which indicates that the control group and the experimental group are comparable in creative thinking skills (fluency-originality-flexibility-problem sensitivity-elaboration) and overall degree, which indicates that at the level of the whole test.

Strategy implementation

The experimental group was taught using the six thinking hats strategy, with two lectures per week, matching the number of lectures and course content of the control group, so the only difference was the teaching strategy, i.e., the six thinking hats group in the experimental group, and the application lasted for a full 6 weeks.

Post-application of the two tests: After completing the six-week strategy implementation, a post-test was administered to students in both the control and experimental groups at the beginning of the seventh week.

Correction of the test: After monitoring the test results of the two groups of students and entering them into the statistical processing table, the statistical programs SPSS and V27 were used for statistical processing and testing.

T-TEST was conducted on two independent groups to determine the difference between the mean values of the telemetry results of psychology students in the control group and the experimental group. The results are presented in the following section.

Results

In this part, the research hypotheses are tested to check their acceptability or unacceptability. They are arranged as follows:

First hypothesis:

There is a statistically significant difference between the mean scores of the experimental group students in the post-test of creative thinking ability and the control group.

The results related to the first hypothesis are shown in Table (3):

Table (3): Difference in mean scores between control and experimental group students in the dimension application (n = 30)

Skill	The Collection	Arithmetic mean	Standard deviation	Value of t	P-value	Significance level
Fluency	Adjuster	14.67	1.8	-11.225	0.000	D statistically
	Experimental	22.27	1.91			
Originality	Adjuster	15	1.77	-7.974	0.000	D statistically
	Experimental	21.87	2.83			
Flexibility	Adjuster	14.2	1.21	-16.387	0.000	D statistically
	Experimental	22.33	1.5			
Sensitivity to problems	Adjuster	13.67	1.29	-14.455	0.000	D statistically
	Experimental	22.87	2.1			
Elaboration (details)	Adjuster	12.53	2.07	-17.828	0.000	D statistically
	Experimental	23.33	1.11			
Total Grade	Adjuster	70.07	4.65	-22.1	0.000	D statistically
	Experimental	112.67	5.84			

The results in Table (3) show that there is a statistically significant difference between the mean scores of the psychology students in the control group and the experimental group in predicting each creative thinking skill level at the 0.05 significance level because the mean score of the students in the experimental group in the dimensional measurement is (112.67), while the mean score of the students in the control group in the same measurement is (70.07), which indicates that the mean score of the psychology students in this group is higher than that of the control group, with a value of (T=-22.1). In contrast, the probability value reaches (0.000), which is lower than the moral level of 0.05, which indicates that in the dimensional measurement, the difference is in favour of the experimental group because it is obvious that in the five skills of creative thinking, the arithmetic mean of the students in the experimental group is higher than that of the students in the control group. The mean score of the experimental group students was (22.27), which was higher than the mean score of the control group students (14.67), while the mean score of the experimental group students in originality was (21, 87), which was higher than the mean score of the control group students (15), while the arithmetic mean of the experimental group students in flexibility was (22.33). In problem identification ability, the arithmetic mean of the experimental group students was (22.87), which was higher than the arithmetic mean of the control group students with the same skills (14.2). The mean score of the control group students was (13.67), and finally, the arithmetic mean of the experimental group students was (23.33), which was higher than the mean score of the control group students (12.53), and the ability to elaborate (details). As seen from the above, the results support the first hypothesis that there is a significant difference in the mean scores of psychology students in the control group and the experimental group in creative thinking ability, and telemetry is in favour of the experimental group.

Second hypothesis:

There is a statistically significant difference between the mean scores of the creative thinking ability test of the experimental group students before and after application, in favour of after application.

The results related to the second hypothesis are shown in Table (4):

Table (4): Difference in average grades of students in the experimental group before and after application (n=15)

Skill	The Collection	Arithmetic mean	Standard deviation	Value of t	P-value	Significance level
Fluency	Adjuster	9.6	2.13	-17.152	0.000	D statistically
	Experimental	22.27	1.91			
Originality	Adjuster	9.73	2.12	-13.304	0.000	D statistically
	Experimental	21.87	2.83			
Flexibility	Adjuster	10.4	1.88	-19.222	0.000	D statistically
	Experimental	22.33	1.5			
Sensitivity to problems	Adjuster	9.13	2.2	-17.491	0.000	D statistically
	Experimental	22.87	2.1			
Elaboration (details)	Adjuster	9.67	2.16	-21.782	0.000	D statistically
	Experimental	23.33	1.11			
Total Grade	Adjuster	48.53	6.52	-28.371	0.000	D statistically
	Experimental	112.67	5.84			

The results in Table (4) show that there is a statistically significant difference between the mean scores of various creative thinking skills of psychology students in the experimental group before and after the test, with a significance level of 0.05, which is in favour of the average score of the post-test (112.67). The average score of the experimental group students in the post-test was (112.67), while the average score of the group of students in the pre-test was (48.53), which shows that the average score of psychology students in the experimental group in the post-test is higher than the average score of students in the same group in the pre-test, where t=-28.371, and the probability value reaches (0.000), which is less than the significance level of 0.05, which shows that the difference is in favour of the experimental group in the post-test. It can be seen that the arithmetic mean of the experimental group students in the post-test of the five creative thinking skills is greater than the tribal measurement. The average score of students in the group with fluency ability is (22.27), which is higher than the average score of students in the same group in the initial arithmetic test (9.6). The average score of students in the experimental group with originality is (21.87), which is higher than the average score of students in the experimental group. The score of the same group of students in the previous measurement was (9.73), and the arithmetic mean of the flexibility ability of the experimental group students was (22.33), which was higher than the arithmetic mean of the students in the initial measurement, equivalent to (10.4). Under the same ability, for the ability to identify problems, the arithmetic mean of the experimental group students in the dimensional measurement was (22.87), which was higher than the arithmetic mean of the students in the initial measurement, that is, (9.13). Finally, the arithmetic mean score of the experimental group students reached (23.33), which was higher than the average score of the same group of students, but in the initial measurement (9.67) with elaboration ability (details). As can be seen from the above, the results support the hypothesis of hypothesis 2, that is, there is a significant difference in the mean scores of the psychology students in the experimental group before and after the measurement of creative thinking ability, which is conducive to the post-measurement.

Fourth Theme: Conclusions and Recommendations

Conclusions:

The study yielded the following results:

1. The results of statistical analysis show that there is no statistically significant difference between the experimental group students and the control group students in the pre-test of the creative thinking ability test, indicating that there is no obvious advantage of one group over the other, which means the equivalence of the two groups before the application of the strategy.
2. I found that in the results of the creative thinking ability test, there is a statistically significant difference between the average scores of the experimental group students and the average scores of the control group students, and the scores of the experimental group students are significantly better than those of the control

group, because the value of (T) is equal to (-22, 1), indicating that the psychology students in the experimental group have a significant advantage over the control group.

3. In the creative thinking ability test, there is a statistically significant difference in the average scores of the pre-test and post-test of the experimental group students, which is in favour of the post-test because the (T) value is equal to (-28.371), indicating the effectiveness of using the six-hat strategy after the application on the development of creative thinking skills of psychology students in the experimental group compared with before the application.

1. Recommendations:

Based on the findings, the following recommendations are made:

1. The faculty of the Faculty of Education must focus on the creative thinking skills achieved in teaching various courses, especially Psychology courses.
2. Workshops and courses need to be organised to train the students of the Faculty of Education to apply creative thinking skills in the Department of Education and Psychology.
3. Efforts should be made to train university teachers at all levels of education to use the Six Hats strategy in the classroom.
4. Provide appropriate and necessary information to the course designers on the meaning of the six-hat strategy so that this information can be considered while designing and planning courses at different educational levels.

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