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ORIGINAL ARTICLE

The Effect of Using the Six Thinking Hats Strategy for Developing Creative Thinking and the Learning of Some Gymnastic Skills among Primary School Students

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ABSTRACT

Background. Educators have sought to develop new teaching methods and strategies with an emphasis on learners who play major roles. This is achieved by preparing different and active situations by increasing motivation and developing their thinking. **Objectives.** The purpose of the study was to design a program using the six thinking hats strategy and to identify its effects on creative thinking and some of the gymnastic skills, namely handstands (HS), forward rolls (FR), and backward rolls (BR) of primary school students. **Methods.** The researchers used the experimental method with 50 students who were randomly divided into two groups, namely an experimental group (n = 25, age = 11.24 ± 0.60 years, height = 143.24 ± 2.29 cm, weight = 42.44 ± 2.29 kg, IQ = 18.36 ± 0.64 scores) and a control group (n = 25, age = 11.24 ± 0.66 years, height = 143.80 ± 3.62 cm, weight = 42.36 ± 2.56 kg, IQ = 18.48 ± 0.59 score). The homogeneity between the two groups was calculated, and the results revealed that there were no differences between the two samples. Concerning the research variables, the educational program was applied twice per week for eight weeks. **Results.** The proposed education program using the six thinking hats strategy had a more positive effect on the development of creative thinking and some of the gymnastic skills being researched for primary school students than did the traditional program, with statistically significant differences in the creative thinking scale of 17.04%. The gymnastic skills that were studied, namely handstands (HS), frontward rolls (FR), and backward rolls (BR) had a relative difference of 74.47 - 108.48%, P<0.005. The differences in the improvement rates for all the variables were in favor of the experimental group. **Conclusion.** Therefore, the proposed educational program using the six thinking hats strategy had a positive effect on the creative thinking and gymnastic skills of the primary school pupils, which resulted in a statistically significant difference in the subsequent tests in favor of the experimental group.

KEYWORDS: ***Six Thinking Hats Strategy, Creative Thinking, Gymnastic Skills, IQ.***

INTRODUCTION

The world has recently witnessed important scientific developments that have exceeded previous developments throughout the ages in all areas of life, and education is no exception. Educators have sought to develop teaching methods and to develop new strategies with a focus on learners, who play the largest roles. This is accomplished by designing situations based on the active participation of the learners and positive interactions that allow them to develop their thinking and skills (1).

The process of learning and receiving information has become quick and easy in the era of the digital revolution, as the creation of new knowledge and discoveries is developing rapidly in all areas. The cognitive revolution and the

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evolution thereof, require the development of human thinking; While the wide demands and interest in the development of human thinking are of paramount importance in childhood, we do not sufficiently encourage children to think for themselves, form independent judgments, be proud of their thoughts, or to be proud of having an individual point of view and to be pleased with their prowess in thinking (2). Teaching children to think creatively is considered to play an important role at the primary school level (3) for children to develop creative thinking. Stimulating and sparking children's imaginations, and teaching them to overcome the ruts in their thinking, are essential to creating the necessary conditions for creative thinking to develop (4).

Creative thinking is a distinct task in students' motivations to learn. In addition, it is considered to be one of the highest modes of thinking. Because creative thinking is a human trait, it is a vast and complex field of study. Thus, there is confusion about the specific definition of creativity; some researchers focus on the characteristics of creative people, while others have focused on the creative product itself. Nonetheless, creative thinking skills are essential for successful learning and success in life, and creative thinking involves a set of skills that can be enhanced across the curriculum (5).

The inclusion of creative thinking processes in pupils' lessons will enable pupils to generate ideas, as creative thinking is a mental process that triggers new ideas and visions, integrates them with previous ideas, and organizes them in creative ways that allow access to new understandings or new productions. Creative thinking is a creative way to perceive information, and is classified according to the four components of fluency (creating multiple ideas), flexibility (changing perspectives quickly), speculating on new ideas, and clarifying ideas. According to Edward de Bono (1992) (6), creative thinking is not a talent but a skill that can be learned. De Bono proposed three diverse concepts of creativity: Creativity means "bringing something that did not exist before, the new thing must be," "value", and must include the concepts of "non-nutrition, change, and creativity, involved in generating an idea, is a thinking skill that can be taught through lateral thinking methods" (7).

Since creative thinking is essential in the new millennium, teachers should provide rich and diverse content to enable pupils to acquire, develop, and apply a wide range of knowledge and skills. Developing thinking skills has multiple benefits, including allowing students to develop independent learning skills (8).

Gymnastics is considered to be an essential part of the physical education curriculum across the world, particularly in children's early school years, and gymnastics lessons are important lessons because they prepare students mentally and physically, as well as increase their motor skills by allowing them to practice these skills using different devices. Given that the field of gymnastics has also developed, gymnastic movements have become more complex; hence, it is necessary to develop education and training in these movements (9). In addition, when learning gymnastics skills, one must adhere to the methodological principles underlying the acquisition of complex motor skills after having mastered an appropriate level of simple motor skills, which makes gymnastics, one of the most attractive sports at present (10).

The quality of the learning process in gymnastics depends directly on the active participation of the learner. Two interrelated factors that influence the acquisition of gymnastic skills are the difficulty of the skill and the ability of the learner (11, 12). For the learner to achieve one or several educational objectives during the educational unit, it is necessary to adopt planned strategies and teaching methods that correspond to the learners' abilities and aptitudes to find joint solutions. Objectives lead to the formation of positive physical and intellectual attitudes toward what is taught or what is required of the students, thus increasing the positive interactions between the students or between the student and the teacher. In addition, practical applications and appropriate methods must be provided to develop the student's ability to practice creative thinking by focusing on strategies that develop creative thinking within the classroom (13).

To provide opportunities for pupils to transform from being passive recipients of knowledge to becoming knowledge builders, it is necessary to shift to a new educational strategy. Traditional teaching methods aim to impart material to students without allowing them to sharpen their minds. The power of thinking, developing a scientific attitude, and increasing understanding and retention among students, which are necessary for the digital age, is often neglected in traditional approaches. The

knowledge that is gained is only useful if it promotes reactive thinking that enables individuals to solve everyday problems. An important educational strategy is the six thinking hats strategy, which helps to develop creative thinking and problem-solving skills (14). This strategy allows students to investigate a problem from several aspects. This technique not only assists students to think, but also has important outputs in terms of ensuring discipline, achieving the desired learning outcomes and behaviors, and teaching students how to react in difficult situations (15).

The six thinking hats strategy is one of the most important methods for developing creativity and improving creative thinking and was designed to teach students how to apply thinking skills correctly, which enhances their thinking skills to a tremendous degree and enables them to create opportunities to solve problems that they may encounter. The main aim of the six thinking hats strategy is to guide students to think in a certain way, then force them to think differently, such as changing their thinking to the "green hat" mode, which engages the students' minds and enables them to see things from different perspectives (16). The importance of the six thinking hats strategy has led to many studies (8, 16-19) applying the method to various subjects and recommending that it be used as an effective teaching strategy.

The performance of any mental or cognitive task depends on a set of thinking processes; in the field of education, learning gymnastic skills requires thinking and appropriate knowledge to obtain the right knowledge and to produce a correct performance. The research problem was developed based on the observation that some of the strategies used in teaching gymnastics do not have an effective impact in terms of increasing the level of knowledge, innovation, and skill performance in students' gymnastics skills. This problem should not be dismissed, as it can be addressed via scientific methods and the use of new and modern strategies to improve teaching practice; one of these new strategies is the six thinking hats strategy, which helps to develop creative thinking and problem-solving skills by allowing students to investigate a problem from several aspects. This technique not only helps students to think, but also provides important outputs in terms of ensuring discipline, achieving the desired learning outcomes and behaviors, and teaching students how to react in difficult situations

Therefore, the researchers considered the six thinking hats strategy to be the best solution for developing students' creative thinking and gymnastic skills to enable them to achieve the desired goals. In addition, reflection on the positive outputs will ensure the development of the educational process for primary school students; this stage is extremely important because it is the foundation stage on which all subsequent stages will be built. To the best of the researcher's knowledge, no previous study has examined the impact of using the six thinking hats strategy on the development of creative thinking and some gymnastic skills in primary school pupils.

We aimed to design a program using the six thinking hats strategy and to determine its impact on the development of creative thinking and some gymnastic skills, namely handstands (HS), frontward rolls (FR), and backward rolls (BR) in primary school students.

The researchers posited that: (a) There would be statistically significant differences between the average pre- and post-implementation measurements in the experimental group of primary school students in terms of creative thinking and some gymnastics skills (HS, FR, BR), with improvements in the post-measurements. (b) There would be statistically significant differences between the average pre- and post-implementation measurements for the control group of primary school students in terms of creative thinking and some gymnastic skills (stands, FR, and BR) compared to those of the primary school students in the experimental approach, with improvements in the post-implementation measurements. (c) There would be statistically significant differences between the averages in the two dimensions of measurements for the control and experimental groups of primary school students in terms of creative thinking and some gymnastic skills (stands, FR, and BR), with improvements in the post-measurements for the experimental group.

MATERIALS AND METHODS

Experimental Design. The program was implemented for an experimental sample of 25 students (average age = 11.24 ± 0.60 years, height = 143.24 ± 2.29 cm, weight = 42.44 ± 2.29 kg, IQ = 18.36 ± 0.64 scores). The research included a

control group of 25 students (average age = 11.24 ± 0.66 years, height = 143.80 ± 3.62 cm, weight = 42.36 ± 2.56 kg, IQ = 18.48 ± 0.59 scores) who were instructed traditionally. The comparison of these groups allowed for the identification of the effect that the proposed educational program using the six thinking hats strategy had on the development of creative thinking and some of the gymnastic skills of primary school students. Ethical approval was received from the relevant university committee. The children's parents were fully informed about the risks and benefits of the study before their children participated in the research and signed institutionally approved informed consent forms. In addition, signed parental consent for the children's participation was obtained.

Research Sample. To test the research hypotheses, the researchers used an experimental design involving two groups, one experimental and the other the control, and analyzed the pre- and post-implementation measurements of both groups. The research participants were primary school students who were aged ten to twelve years during the academic year 2022/2023. In the first semester, the researchers selected a random sample of 50 students. The students were divided into two equal and equivalent groups with 25 students in each: One group was the experimental group, which was presented with the program being researched to develop their creative thinking and some gymnastic skills, while the other was the control group, which was presented with the traditional program in the usual way to observe the development of their creative thinking and some gymnastic skills.

Research Instruments. Tools and Devices: To collect the data for the research, the researchers used a scale for weight measurements, a rastameter for height measurements, a measuring tape to measure the distance (to the nearest centimeter) of the playground, and the floor mat for the application of the experiment, a wooden box with a graduated ruler from zero to 50 centimeters, cones, and barriers. The validity and reliability of the tools and devices used were confirmed by comparing the results of some of the devices by measuring other devices of the same type under the same conditions. These produced the same results, which indicated the reliability and stability of the results.

Tests. Appendix A: John Raven's Color Progressive Matrices Test. The researchers chose the test of sequential matrices to measure the intelligence of the children in the research sample; this test consists of three groups, with each group consisting of 12 matrices and each matrix containing six smaller matrices at the bottom. The examiner chooses one matrix to be complementary to the matrix that is above, and the previous three groups are placed in an ordered form. This arrangement develops a coordinated line of thinking and codified training about the method of work, which provides the opportunity to measure the mental development of children until they reach the stage at which they use standard thinking as a method of deduction, which is the stage of mental maturity. It is also noted that the cards used in the test are in different colors to attract the attention of the children being examined and to prevent them from being distracted by other things (20).

Appendix B: Torrance Test of the Creative Thinking Scoring Scale. The Torrance test for creative thinking was used in the form of activities that were suitable for children in the age group of four to 17 years; children's verbal and non-verbal responses are accepted, and the scale aims to measure creative thinking skills (originality, flexibility, and fluency) (21).

Appendix C: Score Card for the Respective Gymnastics Skills (HS, FR, and BR). The researchers designed a performance evaluation card for the gymnastic skills (handstands and forward and backward rolls) being researched based on the following steps:

1. Determine the purpose of the card: The objective of the card was to evaluate the performance of the gymnastic skills (handstands and forward and backward rolls) being researched.
2. Determine the score for each skill: After determining the purpose of the card, the researchers presented the card in its initial form to experts in the field of gymnastics to determine the degree of each gymnastic skill (handstands and forward and backward rolls) being researched.
3. After polling the experts' opinions about the final form of the performance evaluation card, the performance evaluation criteria for the skills were as follows:
    a) Performance without any technical or aesthetic errors: five points.
    b) Performance with small technical or aesthetic errors: four points.

c) Performance with medium technical or aesthetic errors: three points.
d) Performance with significant technical or aesthetic errors: two points.
e) No performance at all: one point.

The performances of the samples being researched were evaluated by a committee consisting of three experts in the field of gymnastics, and the final score for each skill was determined by calculating the average scores assigned by the three arbitrators.

Program Procedures. The researchers identified the components of the program according to the scientific foundations and presented it to a group of experts from the faculties of physical education in the fields of gymnastics, curricula, and teaching methods to obtain their opinions about the program to determine the appropriateness of the program for students of the given ages, as well as it's content and the organization of its components. After obtaining their opinions, the program attained its final form and was deemed suitable for the aim of the research and the development of creative thinking (originality, flexibility, and fluency) and some of the gymnastic skills (handstands and forward and backward rolls) being researched. The educational program was implemented in two physical education lessons each week, as presented in the study plan for the first cycle of basic education. The lessons, which lasted for 45 minutes each, were implemented for eight weeks.

Research Timeline. Before starting the program, homogeneity and equivalence between the control and the experimental research groups were determined concerning growth rates, intelligence, physical abilities, creative thinking, and the gymnastic skills being researched (HS, FR, and BR). Scientific transactions were enacted to ensure the validity and the stability of the research tools: A pre-implementation measurement was conducted for all the research variables in the two groups, and the basic study was implemented for eight weeks from September 1 to October 27, 2022, with two educational units of 45 minutes per week. The researchers took the determination of the same time distribution for the educational units of the experimental and control groups into account as follows: administrative work (three minutes), public and private warm-ups (10 minutes), practical application/practice (30 s), and conclusion (two s), which was equivalent to the 45-minute application of the learning unit. The general and private warm-ups and the conclusion sections were included as a single content for the experimental and the control groups, and the program being studied was applied practically to develop the creative thinking and gymnastic skills of the pupils in the experimental group. The exploratory study was conducted with a sample of 20 pupils to avoid difficulties that the researchers may have encountered during the implementation of the study, and to determine the amount of time each student spent during the implementation of the study. Testing and ensuring that the program was appropriate for the ages of the study sample was important, both in terms of their physical ability to complete the program and in terms of their understanding of the motor activities. Following the completion of the implementation of the program, the post-implementation measurement of the two research groups was conducted from 29 October to 30 October 2022 using the same method that was followed in the pre-implementation measurement and under the same conditions.

Statistical Analysis. The Statistical Package for the Social Sciences (SPSS) (IBM SPSS Statistics 26. lnk, Chicago, IL, USA) was used for the statistical analyses. The mean and standard deviation were calculated. A t-test analysis and the change ratio were applied, Cohen's D. in this study. The significance level was set at $p < 0.05$.

RESULTS

We presented the results in Tables (1, 2, and 3), indicating the differences between the experimental and control groups in the variables under consideration.

Table 1 shows the differences in the statistical function between the previous and subsequent measurements of the experimental group in the variables under study. Dimensional measurement is preferred as all the calculated values of T are greater than the tabular value of T at the significant level (0.05).

Table 2 there are statistically significant differences between the pre-and post-measurements of the control group in the variables under consideration. They present in favor of post measurements as all the calculated values of T are greater than the value of T tabular at the level of significance (0.05).

Table 3 There are statistically significant differences between the experimental and control research groups in the variables under consideration. These are in favor of the experimental group as all calculated values of T are greater than the tabular value of T at the significance level of 0.05.

Table1. The differences between the averages of pre- and post-measurements of the experimental group in the variables under consideration (n = 25).

Variables	Measuring unit	Pre		Post		95% Confidence Interval of the Difference		T	Cohen's d	Sig.	CR
		Mean	SD.	Mean	SD.	Lower	Upper				
Creative thinking											
O	**Number**	**10.61**	**0.27**	**12.70**	**0.32**	**-2.25**	**-1.92**	**26.07**	**5.21**	**0.000**	**19.64**
F1	**Number**	**3.53**	**0.16**	**5.19**	**0.50**	**-1.89**	**-1.43**	**14.95**	**2.99**	**0.000**	**47.16**
F2	**Number**	**12.07**	**0.23**	**14.57**	**0.40**	**-2.70**	**-2.29**	**24.89**	**4.98**	**0.000**	**20.65**
T	**Number**	**26.21**	**0.41**	**32.45**	**0.81**	**-6.66**	**-5.82**	**30.92**	**6.18**	**0.000**	**23.81**
Skills											
HS	**Number**	**1.11**	**0.16**	**3.07**	**0.39**	**-2.15**	**-1.77**	**21.29**	**4.26**	**0.000**	**176.98**
FR	**Number**	**1.20**	**0.22**	**3.36**	**0.49**	**-2.38**	**-1.93**	**19.72**	**3.94**	**0.000**	**179.26**
BR	**Number**	**1.44**	**0.37**	**3.44**	**0.51**	**-2.17**	**-1.82**	**23.19**	**4.64**	**0.000**	**138.43**

O=originality; F1=Flexibility; F2=fluency; T=Total; HS=Handstand; FR=Forward Roll; BR=Backward Roll; Sig=Statistical significance; DCR=Difference Change Ratio; T-value of t at the significance level of 0.05 = 1.711.

Table 2. The differences between the averages of pre- and post-measurements of the Controlled group in the variables under consideration (n = 25).

Variables	Measuring unit	Pre		Post		95% Confidence Interval of the Difference		T	Cohen's d	Sig.	CR %
		Mean	STD.	Mean	STD.	Lower	Upper				
Creative thinking											
O	Number	10.58	0.29	11.35	0.34	-0.91	-0.64	11.79	2.36	0.000	7.30
F1	Number	3.48	0.05	4.00	0.14	-0.59	-0.46	15.78	3.16	0.000	15.12
F2	Number	12.13	0.26	12.61	0.24	-0.54	-0.40	14.15	2.83	0.000	3.91
T	Number	26.19	0.43	27.96	0.51	-1.96	-1.58	19.48	3.90	0.000	6.77
Skills											
HS	Number	1.11	0.16	2.08	0.23	-1.09	-0.85	17.03	3.41	0.000	87.66
FR	Number	1.20	0.22	2.05	0.11	-0.94	-0.76	19.24	3.85	0.000	70.78
BR	Number	1.44	0.37	2.37	0.37	-1.11	-0.74	10.36	2.07	0.000	63.96

O=originality; F1=Flexibility; F2=fluency; T=Total; HS=Handstand; FR=Forward Roll; BR=Backward Roll; Sig=Statistical significance; DCR=Difference Change Ratio; T-value of t at the significance level of 0.05 = 1.711.

Table 3. The differences between the averages of post-measurements of the experimental and controlled groups in the variables under consideration (n = 50).

Variables	Measuring unit	Experimental		Control		T	Cohen's d	Sig.	DCR %	95% Confidence Interval of the Difference	
		Mean	SD.	Mean	SD.					Lower	Upper
Creative thinking											
O	Number	12.70	0.32	11.35	0.34	14.58	2.06	0.000	12.34	1.16	1.53
F1	Number	5.19	0.50	4.00	0.14	11.53	1.63	0.000	32.04	0.98	1.40
F2	Number	14.57	0.40	12.61	0.24	21.15	2.99	0.000	16.74	1.78	2.15
T	Number	32.45	0.81	27.96	0.51	23.46	3.32	0.000	17.04	4.11	4.88
Skills											
HS	Number	3.07	0.39	2.08	0.23	11.02	1.56	0.000	89.32	0.81	1.17
FR	Number	3.36	0.49	2.05	0.11	12.98	1.83	0.000	108.48	1.10	1.51
BR	Number	3.44	0.51	2.37	0.37	8.54	1.21	0.000	74.47	0.82	1.33

O=originality; F1=Flexibility; F2=fluency; T=Total; HS=Handstand; FR=Forward Roll; BR=Backward Roll; Sig=Statistical significance; DCR=Difference Change Ratio; T-value of t at the significance level of 0.05 = 2.000.

DISCUSSION

It is clear from Table 1 that there were statistically significant differences between the pre-and post-implementation standards for the experimental group in the variables of creative thinking and gymnastic skills (handstand and forward and backward rolls), which were in favor of the dimensional measurement because all the calculated values (T) were greater than the tabular value (T) at the level of significance (0.05). This indicates that there was clear and tangible progress in the levels of the students in the experimental group for the variables of creative thinking and gymnastic skills (handstands and forward and backward rolls) being researched due to the proposed program based on the six thinking hats strategy and the innovation and creation of a new and interesting educational environment that provided an appropriate atmosphere that emphasized the spirit of cooperation and teamwork among students to strengthen the ability to explore, innovate, and access the best ways of engaging in the performance of motor skills and ways of solving problems related to motor skills following the abilities, potential, and individual aptitudes of the students. The program engaged the learners' minds in several modes of thinking by providing a variety of activities, beginning with information and facts, and varied according to the requirements of each hat. This strategy allowed the learners to participate in all the stages of the lesson, ranging from searching for information and facts (white hat) to evaluating education and organization (blue hat), as well as allowing learners to conduct surveys to collect information, engage in positive thinking processes (yellow hat), critical thinking (black hat), and expressing their feelings. The red hat is consistent with the requirements of creative thinking (green hat), as it requires learners to submit development proposals and new creative ideas to modify and organize situations; It is also a strategy that can be used in the presentation of the lesson and the evaluation of the lesson, such as asking the learner to wear a specific hat to provide information, criticism, suggestions, and so forth. It can also be used in the process of reviewing or summarizing the lesson (8, 16-19, 22).

Thus, the hypothesis that there would be statistically significant differences between the average scores for the pre-and post-implementation measurements in the experimental group of primary school students in terms of creative thinking and some gymnastic skills in favor of the post-implementation measurement was proved.

It is clear from Table 2 that there were statistically significant differences between the pre-and post-implementation measurements of the control group for the variables of innovative thinking and gymnastic skills (handstands and forward and backward rolls) in favor of the post-implementation measurements, as all the calculated values of T were greater than was the tabular value (T) at the level of significance (0.05). This indicates the positive effect of traditional methods in the development of innovative thinking and the learning of gymnastic skills (forward and backward rolls and handstands); The researchers attributed this to the fact that the traditional method depended on what the researchers did in terms of explaining and performing the model in the method for performing the skill and their use of teaching aids, practice, repetition, giving feedback, and correcting errors. This allowed the students to learn, which had a positive effect on the efficiency of their performances. The researchers attributed this progress to the presence of the teacher during the education and training processes and the follow-up of the continuous and organized practice of the sequence of performances in the innovative thinking and gymnastic skills being researched, as giving students a clear idea of the required performance makes their performances more effective because the degree of the students' performances depends on the accurate explanation of the correctness of the positions of all parts of the body during the learning process. Increasing the children's motivation to compete among themselves to demonstrate their superiority also contributed to the development of innovative thinking and the learning of gymnastic skills (9, 10, 23).

Thus, the hypothesis that there would be statistically significant differences between the average scores for the pre-and post-implementation measurements for the control group in creative thinking and some of the gymnastic skills of the primary school students, which would be in favor of the post-measurement, was proved.

It is clear from Table 3 that there were statistically significant differences between the average scores for the two dimensions of measurements for the experimental and control research groups in the variables of innovative thinking and gymnastic skills (handstands and forward and backward rolls) in favor of the experimental group.

Thus, it is clear that the experimental group was superior to the control group, which indicates that the proposed program based on the six thinking hats strategy was more positive and effective in terms of the variables of innovative thinking and gymnastic skills (handstands and forward and backward rolls) that were being researched.

As the traditional method makes the teacher the focus of the educational process, this does not give the students sufficient freedom to implement their ideas at any stage of the lesson, including the planning, the implementation, and the evaluation, as students who are being given orders do not feel responsible for the learning process because it relies on the teacher giving all the information. This results in the students having negative attitudes (17, 22, 23).

The researchers also attributed this progress to the six thinking hats strategy that was used with the students in the experimental group, as this strategy provides diverse and multiple thinking patterns that begin with collecting information and facts and proceeds to a discussion of the positive and negative aspects, feelings, and opinions, to produce innovative ideas, make decisions and develop them, as well as to provide students with positive thinking that increases their sense of success in their achievements and provides them with the opportunity to express their feelings. This increased the students' self-confidence, in addition to creating an atmosphere of enjoyment and pleasure among them, which was consistent with the results of existing studies (8, 9, 17-19).

Thus, the hypothesis that there would be statistically significant differences between the average scores for the two dimensions of measurements for the experimental and the control groups in creative thinking and the learning of some gymnastic skills of primary school students in favor of the experimental group was proved.

CONCLUSION

Based on the results of the research, the researchers concluded that the proposed program based on the six thinking hats strategy had a positive impact on the development of creative thinking and the learning of some gymnastic skills on the part of primary school students in the study, as the proposed program that used the six thinking hats strategy had more positive results than did the traditional program concerning the development of creative thinking and the gymnastic skills of these students. The change in the percentages for creative thinking and the learning of some gymnastic skills for the experimental group that participated in the proposed program was greater than it was in the control group that used the traditional program.

APPLICABLE REMARKS

- Based on the results of the research, the researchers recommend implementing the program including the six thinking hats strategy to develop students' creative thinking and gymnastic skills.
- It is also necessary to include pre-service physical education teacher-preparation programs and training in the use of the six thinking hats strategy for developing students' creative thinking and gymnastic skills.
- Directing those involved in the physical education sector to hold courses for physical education teachers to train them to use the six thinking hats strategy to develop innovative thinking and the gymnastic skills of primary school students will require further research and studies to design programs using the six thinking hats strategy to determine its efficacy in developing other motor skills, in addition to diverse activities and variables.
- Conducting more research and studies of the design and use of motor dexterity programs to determine their effectiveness in the learning and development of other motor skills and abilities, as well as possible activities and variables, is recommended in the future.

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AUTHORS' CONTRIBUTIONS

Study concept and design:, Acquisition of data:, Analysis and interpretation of data:, Drafting of the manuscript:, Critical revision of the manuscript for important intellectual content:, Statistical analysis:, Administrative, technical, and material support:, Study supervision: Khairi Mahmoud H Al-Sababha.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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