THE EFFECT OF AN EDUCATIONAL PROGRAM ACCORDING TO THE REIGELUTH MODEL ON REFLECTIVE THINKING AND THE DIGITAL LEVEL OF HIGH JUMP AMONG STUDENTS OF THE FACULTY OF PHYSICAL EDUCATION AND SPORTS SCIENCES

Ihsan Qaddoori Ameen*, Mohammed Qasim Mohammed

College of Physical Education and Sports Sciences, Kirkuk University, Iraq

Abstract

The current study aimed to prepare a measure of reflective thinking in the high jump and to identify the effect of a proposed educational program according to the Reigeluth model in reflective thinking and the digital level of the high jump. The research community consisted of (90) students of the Faculty of Physical Education and Sports Sciences, University of Kirkuk, who are enrolled in the academic year 2021-2022, and 32 students were selected. The selected sample was randomly distributed into two groups (control 16) and (experimental 16). The researchers used the reflective thinking scale prepared by them and the high jump test according to the attempts performed according to international regulations. The educational program for the selected sample was prepared and applied with (12) educational units according to the Reigeluth model to teach the high jump. At the end of the study, the researchers concluded the following: The proposed educational program, according to the Reigeluth model, outperformed the educational program used in the dimensions of reflective thinking among students of the Faculty of Physical Education and Sports Sciences, University of Kirkuk. The proposed educational program according to the Reigeluth model outperformed the educational program in the level of digital achievement of the high jump among the students of the Faculty of Physical Education and Sports Sciences, University of Kirkuk. The researchers recommended the following: The necessity of giving students the opportunity to practice reflective thinking in all its dimensions, Encouraging teachers to use reflective thinking skills while teaching different curricula, the need to prepare and train teachers before and during service to use the Reigeluth model.

Keywords: Reflective thinking. Educational program. High jump

Defining the Research:

Research introduction

*Corresponding Author: Ihsan Qaddoori Ameen, College of Physical Education and Sports Sciences, Kirkuk University, Iraq

Correo-e: ehsannajar@uokirkuk.edu.iq

Our world today, the world of creativity and knowledge, is witnessing a greatly multiplied scientific renaissance in various fields of knowledge, including the educational field, which is facing today rapid changes in all aspects of the educational process, which requires us to put within our priority the development and improvement of the intellectual elements of the learner to the maximum possible degree. By developing their thinking by all possible means, the learner needs to be equipped with thinking skills in order to compete effectively in an era where success, excellence and control are linked to the extent of a person's ability to think well and skill in it.

Accordingly, there is a need for different models of education, as well as finding new models whose purpose is to organize a relatively large number of concepts, principles, procedures, and facts and teach them in short periods of time. Bruner presented the spiral curriculum, ausuble presented the idea of sequential gradation, Norman presented his theory called web learning, and more recently Reigeluth presented the expanded teaching model. This model deals with organizational strategies when they are at the level Expanded, and the expanded level consists of four main operations referred to by Reigeluth:

• Selection - sequrncing - sytnesizing - summarizing (Yusuf Qatami: 425)

• (Kim) emphasizes the importance of reflective thinking for learners and its role in developing thinking and the ability to solve problems and increasing the student's motivation, productivity, self-confidence, and understanding and realizing facts.

Reflective thinking consists of the following:

• Regular work: Everything that an individual learns through repeated use until it becomes an activity that is carried out automatically.

• Meditation: All the emotional and mental activities in which individuals participate with the aim of discovering and deepening their experiences in order to reach new appreciations and understandings.

• Understanding: It means realizing and assimilating concepts without reflecting on their implications or meanings in the person or the practices of the situation.

• Critical meditation: It represents the highest levels of thinking and involves fundamental shifts in viewpoints and is achieved when a person is able to justify his views, thoughts, feelings and actions (Kim: 102).

Ayesh Zeitoun (2017) indicates that the benefits of classroom application of extended theory are as follows:

The Reigeluth theory requires the design of educational methods and plans to learn the principles, concepts, facts and procedures contained, as this theory is not subject to a specific educational method, but leaves the freedom of choice for the teacher to choose his method, which is characterized by the following:

• Its suitability for the educational goals it seeks to achieve.

• Its suitability for selling educational content as it is an educational model and not a teaching method.

• Taking into account the developmental and age characteristics of students in preparing them.

Observing the principle of sequence and follow-up in the teaching steps (Zaytoun: 41).

In order to achieve this goal, educators and specialists advise, to increase interest in our children in order to face new variables within the rapid technological development, and according to the events of the era of globalization and informatics, where the world began as a small village, and human civilization appeared as a product of human thinking that is preparing to engage in a revolution in mental creativity, which makes it imperative We have to prepare our students to keep up with these repercussions, keep pace with these rapid changes, and rely on modern strategies, especially in learning motor skills for all sports events, such as learning the high jump.

Importance of Research

The importance of this research lies in the benefit of the educational program prepared by the researchers, which may constitute a reference for workers in the field of high jump education and training to be exploited with the same activities or when building educational and training units with other activities. Educational supervisors of the subject of physical education can also benefit from this research. And those in charge of building and engineering curricula for physical education, and this study reinforces the studies conducted in the motor learning of the activities of the track and field, which may help postgraduate students to conduct similar research for the purpose of making the educational process more clear, acceptable and exciting for teachers and learners, which may benefit those in charge of it to enrich the educational process , and develop Reflective thinking skills of students in Iraqi schools and universities.

Research Objectives

The research aims to:

1. Preparing a scale for reflective thinking in the high jump.

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2.   To identify the effect of an educational program according to the Reigeluth model on reflective thinking and the digital level of the high jump.

Research hypotheses

•   There are statistically significant differences between the pre and post-tests of the control group in the dimensions of reflective thinking and the digital level in the high jump in favor of the post-tests.

•   There are statistically significant differences between the pre and post-tests of the experimental group in the dimensions of reflective thinking and the digital level in the high jump in favor of the post-tests.

•   There are statistically significant differences between the experimental group and the control group in the post-test in the dimensions of reflective thinking and the digital level in the high jump in favor of the experimental group.

Research Procedures

Research methodology

The researchers used the experimental approach due to its suitability to the nature of the research, as they followed the experimental design with two pre and post tests for the experimental and control groups.

Research sample

The research community consisted of (90) students of the Faculty of Physical Education and Sports Sciences, University of Kirkuk, who are enrolled in the academic year 2021-2022, and 32 students were selected after excluding 28 students for their participation in rationing the reflective thinking scale prepared. In addition, 30 students were excluded because they did not want to participate in the research procedures. The randomly selected sample was distributed into two groups as follows:

•   A sample of (16) students as a control group to whom the curriculum set by the college is applied.

•   A sample of (16) students as an experimental group to whom the proposed educational program is applied according to the Reigeluth model.

Statistical Description of the Research Sample

Homogeneity between the two groups (control - experimental)

The basic variables of the sample (under study) were measured in variables (age, height, mass) in order to control the variables that may affect the research procedures, and the following table 1 explains this (Table 1).

It is clear from Table 1 regarding the homogeneity of the data of the research sample in the basic primary measurements that the data of the total research sample is moderate and not dispersed and is characterized by the normal distribution of the sample, as the values of the torsion coefficient range from (-001 to 0.39). This value is close to zero. The coefficient of flattening ranged between (-1.59 to -0.62), and this means that the fluctuation of the equinox curve is considered acceptable and on average, and it does not fluctuate up or down, which confirms the similarity of the members of the research group in the initial variables before the experiment.

Equivalence between the two groups (control - experimental)

It is clear from table 2 of the statistical indications of the basic variables of the experimental and control groups before the experiment that there were no significant differences, at the level of (0.05) between the experimental and control groups in the level of digital achievement and the dimensions of the reflective thinking scale, where the calculated (t) value was between (0.32 to

1.55).) and these values are less than the tabular (T) value at the level (0.05) = (2.145) and a level of significance greater than (0.05), which indicates the equivalence of the two groups in the digital level and the dimensions of the reflective thinking scale.

Data Collection Tools

First: the reflective thinking scale

The researchers designed the reflective thinking scale after looking at the scientific references and studies related to the subject of the research and conducting personal interviews with some students and teachers of the specialty, Appendix No (1) As a basic tool for data collection with the aim of developing an educational curriculum according to the Reigeluth model in reflective thinking and achievement in the high jump.

Scientific Transactions for the Scale of Reflective Thinking

Validity of the content

The researchers presented the phrases of the scale to a group of gentlemen experts specialized in the field of motor learning in physical education, sports training and high jump, who meet the conditions for obtaining information from the PhD holders, who were (10), in order to seek their opinions in the following:

•   Ensure the adequacy and appropriateness of the phrases for the scale.

•   Ensure the integrity of the wording and the clarity of the phrase.

•   Add, delete, modify or merge phrases.

And table 3 shows the frequencies and the percentage of the opinions of the experts on each of the phrases of the reflective thinking scale (Table 3).

It is clear from Table 3 the frequencies and the percentage of the opinions of the experts on each of the phrases of the reflective thinking scale, which ranged between (80%: 100%). The two researchers were satisfied with an agreement percentage of (80%) or more. Thus, there are no modifications to the scale phrases.

Validity of the internal consistency: The validity of the phrases of the reflective thinking scale was confirmed by calculating the correlation coefficient between the degree of each phrase and the total score of the scale, and this is shown in Table 4 (Table 4).

It is clear from table 4 that the correlation coefficients between each phrase and the total score of the scale are statistically significant.

Reliability:

The reliability was verified by using Cronbach's alpha coefficient to find the reliability of the scale phrases, and this is shown in table 5 (Table 5).

It is clear from table 5 that the reliability coefficient of the scale phrases is acceptable (greater than 0.70), which indicates the reliability of the scale phrases and that any deletion of any expression will negatively affect the reliability of the scale.

Second: The educational program according to the Reigeluth model:

•   The researchers built the proposed educational program according to the Reigeluth model and demonstrated its impact on reflective thinking skills and digital achievement of the high jump effectiveness.

•   Then (12) educational units were formed according to the Reigeluth model to teach the effectiveness of the high jump.

Table 1: Statistical indications of the research sample in the basic variables before the experiment.

variables	measuring unit	Arithmetic mean	median	standard deviation	torsion coefficient	flattening coefficient
age	year	18.70	19	2.60	0.17	-0.88
height	cm	176.35	176.50	5.09	0.01	-1.59
mass	kg	73.25	73.00	6.26	0.39	-1.18

Table 2: Equivalence between the control and experimental groups in the digital level and the dimensions of the reflective thinking scale.

variables		control group		experimental group		T value	significance
		Arithmetic mean	Std.	Arithmetic mean	Std.		
level of achievement in the high jump		1.08	0.69	1.10	0.71	0.85	0.41
Dimensions of the reflective thinking scale	understanding	1.63	0.75	1.70	0.73	1.55	0.14
	Meditation	1.50	0.58	1.52	0.60	0.56	0.45
	regular work	1.89	0.87	1.95	0.88	1.04	0.31
	critical meditation	2.02	0.71	2.04	0.70	0.32	0.76

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Table 3: Frequencies and percentage of expert opinions on each phrases of the reflective thinking scale.

No.	Frequencies	percentage	No.	Frequencies	percentage	No.	Frequencies	percentage	No.	Frequencies	percentage
	First axis			Second axis			Third axis			Fourth Axis	
1	10	100%	1	10	100%	1	10	100%	1	10	100%
2	9	90%	2	8	80%	2	9	90%	2	9	90%
3	10	100%	3	9	90%	3	9	90%	3	8	80%
4	8	80%	4	8	80%	4	10	100%	4	9	90%
5	8	80%	5	10	100%	5	8	80%	5	10	100%
6	9	90%	6	9	90%	6	10	100%	6	8	80%

Table 4: Correlation coefficient between the score of each statement and the total score of the scale.

Phrase no.	Correlation coefficient	Phrase no.	Correlation coefficient	Phrase no.	Correlation coefficient	Phrase no.	Correlation coefficient
	First axis		Second axis		Third axis		Fourth Axis
1	0.70	1	0.78	1	0.73	1	0.74
2	0.81	2	0.78	2	0.75	2	0.76
3	0.90	3	0.74	3	0.76	3	0.81
4	0.74	4	0.72	4	0.84	4	0.70
5	0.85	5	0.88	5	0.86	5	0.90
6	0.95	6	0.84	6	0.84	6	0.85

Table 5: Cronbach's alpha reliability coefficient for reflective thinking scale phrases.

Phrase no.	Cronbach's alpha reliability coefficient if the statement is omitted	Phrase no.	Cronbach's alpha reliability coefficient if the statement is omitted	Phrase no.	Cronbach's alpha reliability coefficient if the statement is omitted	Phrase no.	Cronbach's alpha reliability coefficient if the statement is omitted
	First axis		Second axis		Third axis		Fourth Axis
1	0.708	1	0.834	1	0.748	1	0.901
2	0.795	2	0.714	2	0.895	2	0.847
3	0.784	3	0.835	3	0.780	3	0.800
4	0.790	4	0.835	4	0.899	4	0.793
5	0.888	5	0.780	5	0.899	5	0.794
6	0.793	6	0.900	6	0.899	6	0.794

• The program was built after referring to many studies and knowledgeable references.

• The educational program included teaching the technical stages of the high jump event according to the Reguluth model.

• The educational program consists of (12) educational units to teach the effectiveness of the high jump. The educational program was implemented by two study units each week.

Third: the level of digital achievement of students in the high jump

Conditions for measuring the digital achievement of the high jump effectiveness, based on the international law of athletics:

• Three attempts should be made for each height.

• After the successful attempt, the student moves to the next height.

• The performance of the attempts is arranged after the draw.

• It is performed in the Fosbury Technique.

• The player is out of the competition if he fails in three consecutive attempts, regardless of height.

• The student is recorded for achieving the highest crossed height of the crossbar.

• Correct jump conditions:

• Pass the bar without falling.

• Jumping on one foot.

• The only way to perform is by Fosbury Technique

• Do not touch the bar with your hands.

• Execute attempts before the time runs out.

Presentation and Discussion of the Results

Presentation and discussion of the results of the first hypothesis: There are statistically significant differences, between the pre and post-tests of the control group in the dimensions of reflective thinking and the digital level in the high jump in favor of the post-test (Table 6).

Table 6 illustrates the following: There are statistically significant differences, at the level (0.05) between the mean scores of the two pre and post-test scores of the control group in favor of the mean of the post-test at the digital level and the dimensions of the reflective thinking scale, where the calculated "T" value ranged between (4.95: 12.64).

The researchers believe that the differences in the control group result from the actual program applied in the College of Physical Education and Sports Sciences, University of Kirkuk, and this indicates that the educational curriculum in the college works to improve the performance of students in high jump.

Presentation and discussion of the results of the second hypothesis: There are statistically significant differences between, the pre and post-tests of the experimental group in the dimensions of reflective thinking and the digital level in the high jump in favor of the post-test (Table 7).

It is clear from the results of Table 7 that: There are statistically significant differences, at the level (0.05) between the mean scores of the two pre- and post-tests scores of the experimental group in favor of the mean of the post-test of the digital level and the dimensions of the reflective thinking scale, where the calculated "T" value ranged between (7.94: 17.93).

The researchers believe that the educational program according to the Reigeluth model led to the development of reflective thinking and the improvement of the digital level of the high jump among the study sample, Organizing the educational program according to the Reguluth model saved time and effort, and made the learner more motivated and active through creative activities that he practiced during the educational units, which increased the student's self-confidence.

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Table 6: Significance of the statistical differences of the (T) test between the pre and post-tests in the level of digital achievement and the dimensions of the reflective thinking scale of the control group.

variables		Pre-test		Post-test		T value	significance
		Arithmetic mean	Std.	Arithmetic mean	Std.		
level of achievement in the high jump		1.12	0.25	1.25	0.38	4.95	0.00
Dimensions of the reflective thinking scale	understanding	1.59	0.47	2.13	0.59	6.65	0.00
	Meditation	1.52	0.63	2.71	0.77	9.74	0.00
	regular work	1.93	0.69	2.94	0.92	8.94	0.00
	critical meditation	1.98	0.75	3.12	0.89	12.64	0.00

Table 7: The significance of the statistical differences of the (T) test between the pre and post-tests in the level of digital achievement and the dimensions of the reflective thinking scale of the experimental group.

variables		Pre-test		Post-test		T value	significance
		Arithmetic mean	Std.	Arithmetic mean	Std.		
level of achievement in the high jump		1.08	0.25	1.37	0.38	7.94	0.00
Dimensions of the reflective thinking scale	understanding	1.55	0.47	3.54	0.59	13.68	0.00
	Meditation	1.45	0.63	4.15	0.77	16.94	0.00
	regular work	1.94	0.69	3.94	0.92	14.80	0.00
	critical meditation	1.90	0.75	4.12	0.89	17.93	0.00

Table 8: The significance of the statistical differences of the (T) test in the post-test in the level of digital achievement and the dimensions of the reflective thinking scale between the control and experimental groups.

variables		control group		experimental group		T value	significance
		Arithmetic mean	Std.	Arithmetic mean	Std.		
level of achievement in the high jump		1.25	0.38	1.37	0.38	5.67	0.00
Dimensions of the reflective thinking scale	understanding	2.13	0.59	3.54	0.59	6.92	0.00
	Meditation	2.71	0.77	4.15	0.77	13.54	0.00
	regular work	2.94	0.92	3.94	0.92	8.74	0.00
	critical meditation	3.12	0.89	4.12	0.89	7.05	0.00

This is consistent with the study of Atef Muhammad Abdullah (2012), which confirmed that the use of the expanded model helped in linking ideas and integrating them together in the form of procedures or principles and realizing the relationships of similarities and differences between the ideas included in the lessons presented, and learning abstract concepts in a simplified and expanded manner helped To achieve meaningful learning, which led to the survival of the effect of learning, and what helped to deepen understanding, students also practice metacognitive processes.

The results of Afnan Darwazah's study (1993) also indicated that the extended Reigeluth model was concerned with organizing the content in an orderly, orderly and sequential manner from the general to the specific. The comprehensive conclusion and the participation of the learner during its stages in a way that raises attention and increases classroom interaction.

Presentation and discussion of the results of the third hypothesis: There are statistically significant differences between the experimental group and the control group in the post-test in the dimensions of reflective thinking and the digital level in the high jump in favor of the experimental group (Table 8).

The results of Table 8 show the following: There are statistically significant differences, at the level of (0.05) between the mean scores of the post-test of the experimental group and the control group in the digital level and the dimensions of the reflective thinking scale in favor of the experimental group, where the calculated "T" value ranged between (5.67:13.54).

The researchers attribute the reason for the superiority of the experimental group to the fact that the prepared program took into account the steps of the Reigeluth model in reflective thinking and the gradation of exercises according to the sequence (understanding - meditation - regular work - critical reflection and performance). The exercises were gradual in clarifying and learning the high jump in an ascending manner, i.e. from easy to difficult, taking into account to some extent the presence of vitality, activity, excitement and suspense, because this model (Abdul Jalil 2019) "depends on the gradual learning of concepts, principles and procedures from simple to complex and from general to specific and linking Internal and external relations in the educational material (Abdul Jalil: 11).

The researchers also attribute the reason for the superiority of the students of the experimental group that learned the high jump according to the Reigeluth model over the students of the control group that studied according to the usual method of learning based on the teaching style, as the model has helped in the in-depth understanding of fragmented ideas and an increase in the

amount of information retention, resistance to forgetting and linking ideas And merging them together, thus, the experimental group showed superiority in reflective thinking and digital achievement.

This is consistent with the results of the study of Atef Muhammad Abdullah (2012) that the extended teaching model helped students to think about the subject of their study and link it to other cognitive topics in addition to conducting similar operations and practicing other mental operations such as the strategy of cognitive activation that helped develop thinking among students, as well In addition, the nature of reflective thinking itself and the training it includes in decision-making and problem-solving has also helped to develop different aspects of thinking for students.

It also agrees with the results of the study of Belkacem Wadoud Mahoubi, Ahmed Belkacem Kunduz (2016) that the use of the extended teaching model led to the superiority of the students of the experimental group over the students of the control group in reflective thinking, this superiority may be due to the teaching method followed according to the expanded model, which led to the development of reflective thinking skills represented in (defining the problem or situation, describing the event or situation, identifying the possible reasons for the occurrence of the situation or event, interpreting the data, determining the reasons for making a certain decision).

Conclusions and Recommendations

Conclusions

In the light of the research results, the researcher concludes the following:

• The educational program used in the College of Physical Education and Sports Sciences, University of Kirkuk, has an impact on the dimensions of reflective thinking and the digital level of the high jump among students.

• The proposed educational program contributed effectively according to the Reigeluth model in developing the dimensions of reflective thinking and the development of the level of digital achievement of the high jump among students of the Faculty of Physical Education and Sports Sciences, University of Kirkuk.

• The experimental group, which used the proposed educational program according to the Reguluth model, was superior to the control group, which relied on the followed educational program in the dimensions of reflective thinking and the level of digital achievement.

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Recommendations

• The need to provide students with the opportunity to practice reflective thinking in all its dimensions.

• Encouraging teachers to use reflective thinking skills while teaching the different curricula.

• The need to prepare and train teachers before and during service to use the Reigeluth model.

• Conducting other similar studies using the Reigeluth model in developing reflective thinking and learning skills in other sports.

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No.	phrases	Strongly agree	agree	agree to a certain extent	Disagree	Strongly disagree
1	My attendance at the lectures spares me from thinking a lot about understanding the performance.					
2	Continuously and at the beginning of the study, I do the appropriate warm-up for the high jump.					
3	As long as I remember the technical stages during the performance, there is no need to think too much.					
4	I make the same mistakes in learning the high jump without thinking about what I'm doing.					
5	Sometimes I repeat some attempts without thinking about the results.					
6	Before the teacher comes, we start with the jumping process without distinguishing between the ways of jumping.					

Appendix 1: Reflective thinking scale.

First axis: regular work

No.	phrases	Strongly agree	agree	agree to a certain extent	Disagree	Strongly disagree
1	I try to reach the ideal approach speed that suits the high jump.					
2	Always thinking about how to perform the high jump in the Fosbury way.					
3	High jump performance requires that you understand all the aspects you have learned.					
4	Understand the high jump terminology used by the instructor.					
5	I'm trying to understand the relationship between curve approach and ascent.					
6	The practical and theoretical side of the high jump must be understood in order to succeed.					

Second axis: understanding

No.	phrases	Strongly agree	agree	agree to a certain extent	Disagree	Strongly disagree
1	I'm contemplating switching the method of jumping in order to change the centre of gravity.					
2	I think about how the head is thrown back and the knees are apart in order to arch the back.					
3	I often reflect on my performance before and after the performance in order to improve my ascent and flight.					
4	I use my previous experiences to learn from them and develop them in the future.					
5	I think and enjoy what I do and look for new ways to perform the same.					
6	As a result of the experience I gained from studying high jump, I changed the way I look at myself deeper than before.					

Third axis: meditation

No.	phrases	Strongly agree	agree	agree to a certain extent	Disagree	Strongly disagree
1	Compare the amount of ground push between different jumping attempts.					
2	During my study of this chapter, I discovered my mistakes that I thought were correct.					
3	As a result of my increased experience, I changed the way I used to perform the technical stages.					
4	I discuss with my colleagues about their ways of thinking about performance to improve thinking in a better way.					
5	During my studies in athletics I discovered the right take-up foot.					
6	My ideas that I held earlier are further developed in this chapter.					

Fourth axis: critical meditation