The effect of an educational program using virtual reality technology on learning some basic skills in gymnastics for handicapped

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Introduction and research problem:-

Through the work of the **researcher** in gymnastics, I noticed that beginners find it difficult to learn gymnastics skills because they require physical, skill, cognitive, excited and motivated abilities, The learner does not find the desire and excitement to learn and be a future for information only and does not have a concerted idea especially that most gymnastics coaches do not perform a model for some skills and thus It affects me on the skill level of beginners, so the researcher tended to take advantage of technological advancements and modern techniques rich in audio, visual and mental stimuli, and the learner will be a participant in the educational process, including the augmented reality technology, which helps to build a sound movement perception of performance in the minds of learners and the sound and kinetic effects work to attract the attention of learners and quickly Understanding and focusing on the method of performance and the correct movement sequence of the skills under investigation and careful observation of the temporal aspects of the stages of performance (preliminary-main-final) and the path of the motor path of the arms, legs, trunk and head during skill performance and the use of the mobile phone now present in most societies through the use of mobile augmented reality technology in learning , which prompted the **researcher** to use augmented reality technology to improve With the level of skill performance of the skills under discussion in gymnastics.

Research aims:

This research aims to design an educational program using augmented reality technology and to identify its effect on the level of skill performance of people with special needs in gymnastics.

Research Hypotheses:

1- There are statistically significant differences between the means of the pre and post measures of the experimental group in the level of skill performance in favor of the post measurement.

2- There are statistically significant differences between the means of the pre and post measures of the control

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group in the level of skill performance in favor of the post measurement.

3- There are statistically significant differences between the two dimensional averages of the experimental and control groups in the level of skill performance in favor of the experimental group.

Research procedures:

First, the research methodology:

The **researcher** used the experimental method due to its suitability to the nature of this study, She used one of the experimental designs for two groups, one experimental and the other controlling, using the pre and post measurement.

Second: The research Society and sample:

The **researcher** selected the study sample by the deliberate method from the students of Al-Amal School in Jazan, who numbered (40) students for the 2018/2019 academic year, whose mental age ranged from 6 to 9 years, their chronological age ranged from 9 to 12 years, and their IQ scores from 50-70 on the Stanford scale - Binet "for intelligence and they were distributed randomly into two groups, one experimental and the other controlling. Each group consists of (10) students, and the number of the exploratory sample reached (20) students from the research community outside the basic sample in order to

conduct scientific transactions (believe - stability).

Moderation of the research sample data:

The **researcher** verified the occurrence of the research sample under the normal curve and therefore the equilibrium distribution by using skewness coefficients to find the homogeneity factor for the basic and experimental study variables Where it ranged skewness coefficients (0.01-0.86). **Attachment(2)**

Fifth: Data collection methods and tools:

1- Devices and tools used in the research. **Attachment (1 / b)**

2- Growth rates. **Attachment (1 / c)**

3- Personal Interviews. **Attachment (2)**

4- The tests (physical - skill) used in the research. **Attachment (3), (4)**

5- Data recording forms and test results. **Attachment (5)**

Fourth: Scientific transactions used for the tests:

1. Believe physical and skill tests. Attachment (1 / d)

2. The stability of physical and skill tests. Attachment (1 / e)

Fifth: The proposed electronic educational program:

The **researcher** has prepared the educational program so that it includes (8) weeks at the rate of three units per week, meaning that the program

includes (24) educational units, unit time 45 s which includes (the educational and applied part) 20 s in the educational unit and the program includes (3) educational skills for

mastery and improvement of performance , And Table (11) shows the time distribution of the proposed program.

Table (11)
Time distribution of the proposed educational program

n	Content	Time distribution	
1	Number of weeks	8	
2	The number of educational units per week	3	
3	The number of educational units as a whole	24	
4	Application time per unit	20	
		10 min explanation and model	10 min application
5	The total time of the program	1080 min	

Sixth: Search application steps:

The **researcher** applied The pre-measurements of the two research groups were conducted on Sunday 24/2/2019 for the physical and skill tests and applied the educational program using 3D-enhanced realistic video technology on the experimental group and the "traditional method" (verbal explanation and performance of the practical model) on the control group from Sunday 3/3/2019 until Tuesday 23/4/2019 In the school's gymnastics hall, where the researcher and her assistants implemented the proposed program for a period of (8) weeks .. at the rate of (3) educational

units per week .. with a total of (24) units, applied The post-measurements On Tuesday, 4/30/2019.

Tenthly: Statistical Processes:

The statistical treatment was "Descriptive statistics "measures of central tendency standard deviation torsion coefficients", Coefficient of correlation to calculate the stability of physical and skill tests, T test, Analysis of one-way variation, Percentage improvement by percentages.

Presentation and discussion of the results: -

1) Presentation and discussion of the first hypothesis:

Table (6)
Significance of differences between the mean of two measurements
(pre– post) in the skill level for the control group N = 10

variables	Measure unit	pre measurement		post measurement		Means differen ce	Calculate d 'T' value	Improve scription
		mean	s.d	mean	s.d			
Front rolling	points	0.55	0.30	0.87	0.42	0.32	1.73	58.18
Back rolling	points	0.23	0.07	0.64	0.28	0.41	3.22	178.26
Handstand	points	0.12	0.03	0.53	0.27	0.41	3.55	342.67

The value of "P" Driven at the level (0.05) = (1.68)

Seen from the table There are significant differences where the value of (t) calculated higher than the values of (T) Driven at the level of significance (0.05).
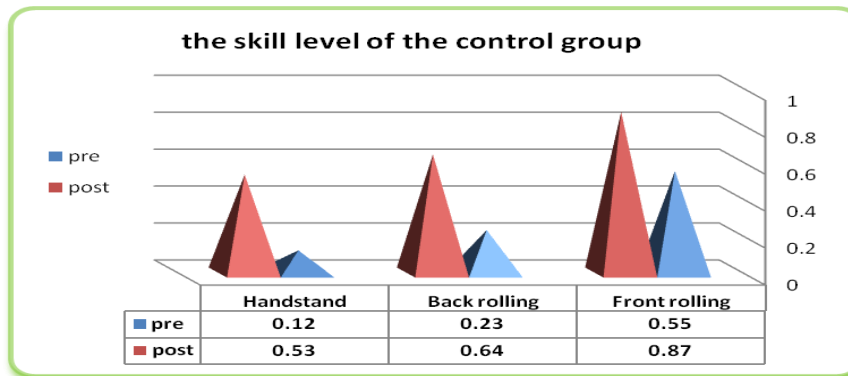

Figure (1)

the skill level for the control group

Table (12) shows that there are statistically significant differences between the averages of the pre and post measures of the control group in the level of performance of the skills of the skills under discussion (rolling front ball - back rolling - standing on the hands) in favor of the post measurement, as it is clear that the value of "T" for skills under discussion in the variables (the introductory stage, the main stage, and the final stage), they reached respectively (1.73- 3.22- 3.55), Therefore the value of "t" computed for the skills variables under discussion is greater than the tabular "t" value at a significant level (0.05) than Confirms the existence of statistically significant differences in favor of the post measurement.

Reminds both **Todorov, Shadmer** 1997 AD (18), and **Stein Jeelion** 1996 AD (16) state that the traditional method of verbal explanation and

performance of the practical model for the skill to be learned led to the learner's understanding of and learning of these motor skills.

The **researcher** also attributes this result to the fact that female students of the control group are considered as beginners in the performance of this skill, and their knowledge of this skill is limited. Therefore, providing any information to these students will increase their knowledge of the skill.

This is consistent with the results of the studies of **AlShaima Abd al-Latif** 2010 (4), **Laila Abdel Moneim**, **Nadia Shousha** 2008 (13), **Fu Pei-Wen** 2006

(10), where the results of these studies indicated that the effect of the classroom method cannot be overlooked as it leads to learning Good as it has an effect on the progress of the skill level of performance.

With this result, the first hypothesis of the research is achieved, which states that "there are statistically significant differences between the means of the pre and post measures of the control group in the level of skill performance of the skill variables under discussion in favor of the post-measurement".

2) Presentation and discussion of the results of the second hypothesis:

Table (13)

Significance of differences between the mean of two measurements (pre– post) in the skill level for the experimental group N = 10

variables	Measure unit	pre measurement		post measurement		Means difference	Calculated 'T' value	Improve scription
		mean	s.d	mean	s.d			
Front rolling	points	0.53	0.29	1.35	0.72	0.82	6.16	154.72
Back rolling	points	0.22	0.07	0.94	0.48	0.72	5.74	327.27
Handstand	points	0.14	0.04	0.81	0.37	0.67	5.33	478.57

The value of "P" Driven at the level (0.05) = (1.68)

Seen from the table There are significant differences where the value of (t) calculated higher than the values of (T) Driven at the level of significance (0.05).
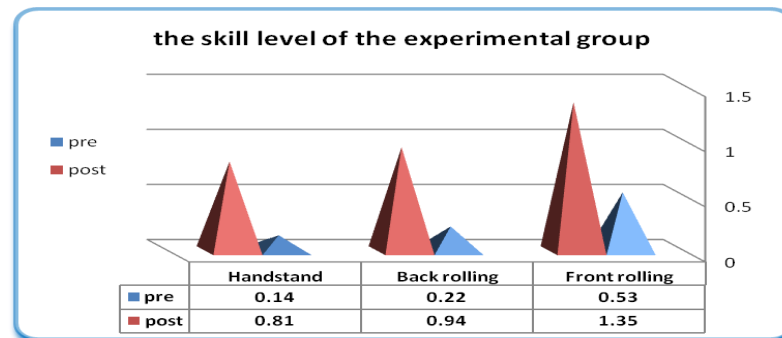
Figure (2)
the skill level for the experimental group

It is evident through Table (13) that there are statistically significant differences between the means of the pre and post measures of the experimental research group in the level of performance of the skills of the skills under discussion (front rolling - back rolling - handstand) in the variables (the introductory stage, the main stage, the final stage) It reached respectively (6.16, 5.74, and 5.33), Consequently, the value of "T" computed for the skill variables is greater than the tabular value of "T" at a significant level (0.05), which confirms the existence of statistically significant differences in favor of the post measurement.

The **researcher** also attributes this result to the fact that the use of learning using realistic video technology enhanced in 3D format in learning the skills under discussion has an effective effect on the students and contributed to the formation of their knowledge base prior to the actual performance, through the diversity of the sources of experience it provides as well as the opportunity for learners to control over This information is remembered and easy to retrieve during performance, which contributes to acquiring and developing the correct technical performance among the learners, which makes it a good entry point for the formulation of educational programs capable of taking into account individual differences between learners and increases active learning strategies and learner-centered learning strategies.

This result is consistent with the results of the study of **Hayam al-Ashmawy 2019 (11)**, and **Mohamed Abdel**

Wahab 2018 (14), where the results of those studies indicated that the use of learning using realistic video technology enhanced in 3D format had a positive effect on the skill side, Which led to improving the level of skill performance in favor of the post measurement of the experimental group.

With this result, what came in the second hypothesis of the research hypothesis is achieved, which states that "there are statistically significant differences between the means of the pre and post measures of the experimental group in the level of skill performance of the skill variables under discussion in favor of the post measurement.

3) Presentation and discussion of the results of the third hypothesis:

Table (14)

The improvement rates between the mean of two measurements for the control and experimental groups in the level of skill performance N1 =N2= 10

variables	Measure unit	experimental group		control group		Means difference	Calculated 'T' value	Improve scription
		mean	s.d	mean	s.d			
Front rolling	points	1.35	0.72	0.87	0.42	0.48	6.60	55.17
Back rolling	points	0.94	0.48	0.64	0.28	0.30	5.23	46.88
Handstand	points	0.81	0.37	0.53	0.27	0.28	4.26	52.83

The value of "P" Driven at the level (0.05) = (1.68)

Table (14) shows that there are statistically significant differences at a significant level (0.05) between the mean of the two dimensional measures of the control and experimental groups in the level of performance of the skills under discussion and in favor of the post measurement of the experimental group.
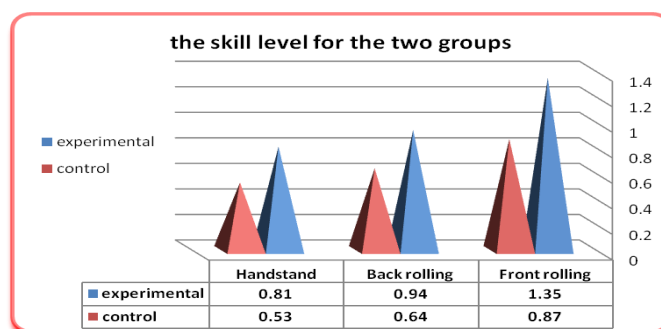
the skill level for the two groups

	Handstand	Back rolling	Front rolling
experimental	0.81	0.94	1.35
control	0.53	0.64	0.87

Figure (3)

the skill level for the control and experimental groups

Table (14) shows that there are statistically significant differences in the two dimensional measures of the experimental and control groups in the level of skill performance and cognitive achievement of some gymnastic skills (under discussion), where the differences came in favor of the experimental group (virtual reality) and the researcher returns the reason for the superiority of the experimental group over the control group in The level of skillful performance to using the educational program using the enhanced realistic video technology in 3D format, which is done by displaying skills before performing them, and the learner returns to the program whenever he needs it, and that he sees the motor skill model that has steady performance no matter how often the model is presented in the appropriate manner with its capabilities and needs, Consequently it has a positive role in forming a proper perception of the motor skill in the mind of the learner and proving it, as well as the freedom to roam within the program and the link between the technical and educational aspects, how to correct errors and the auxiliary tools, which removes the confusion that may occur in the performance of the learners during the educational unit in addition to presenting the skills assessed to the learners in a manner. Interesting and attractive that led to the removal of the difficulties that were encountered during the educational process as it is characterized by a degree of difficulty during its performance, And thus reduce the frequent presence of common mistakes that may appear among learners during

the application and take advantage of this time that is wasted to correct those errors and repeat the application again. From the above, the third hypothesis has been fulfilled, which states "There are statistically significant differences between the two post measurements of the experimental and control groups in the level of skill performance of the skill variables under discussion in favor of the experimental group".

Ninth- conclusions:

In light of the nature of this study and the sample and the methodology used and the results of the statistical analysis in the scope of this research **researcher** reached the following conclusions:

1- The effect of the 3D enhanced reality video technology program positively affected the learners of the experimental group in improving the skill level of the selected skills "under discussion".

2- The use of the educational program with the enhanced realistic video technology in 3D format was more effective and positive than the class style in the skill level of the selected skills "under discussion " for the experimental group better than the post

measurements of the control group that used the traditional method.

Recommendations:

According to the results indicated in this research, the **researcher** recommended the following:

1- Spreading the idea of using learning using realistic video technology enhanced in 3D format and applying it in practice to all scientific disciplines among learners, training them and encouraging them to use modern technologies in teaching gymnastics.

2- Conducting similar studies aimed at teaching various gymnastics skills for the different age groups in general and physical education in particular.

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