

The The effect of the infographic method on learning some offensive skills in handball For students of the second cycle of basic education

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Introduction and problem of research:

There are many tremendous technological advancements especially in the field of education, which in turn require changing the curricula and its multiple methods. The educational development that is happening now has made the educational process turn from just considering the teacher as a tutor and the learner as a recipient of information to more than that, which is to develop methods of explanation for the teacher and make him a designer of the educational material and its development, as well as the creative thought, conviction and understanding of the learner, and the real benefit of technology in the educational field is to reformulate and direct the teacher's thought so that they can build a capable learner who is able to solve problems (19:30).

The importance of infographics has increased in our contemporary world, which is described as the world of the visual boom, where most of the information is transmitted in visual images through laptops, handheld devices and smart phones, which makes the use of infographics one of the appropriate options for displaying that information in a simple form so that it is easy to digest, read it in a quick and concise way through in different styles of designs, and then shared, and circulated among Internet users around the world. (26:83)

Muhammad Shaltout (2016) believes that the art of infographics is one of the arts that help learners receive information and knowledge through an interesting style, which gives new visual forms that collect information and present it in an attractive image and thus work to change their way of thinking towards the huge amount of information, simplification and ease In reading these huge amounts of informational data by the learner, who in turn seeks to use means to help him in facing the huge amount of information in this wide world. (22:15)

"Ashraf Abdel Al- Latif " (2016) points out that the infographic is a powerful educational tool for teachers that can be used in various educational fields, because it enables learners and provides them with intellectual skills and move them to the stage of analysis and synthesis. It is also one of the most utilized methods in helping students participate in education and think about new information (4 : 45)

Through the researchers' review of a group of related studies, such as the study of **Amro Sayed** "(2021) (14) "**Mashael Khalil**" (2021) (23), "**Mohammed Gamal** " (2021) (20), **Ghadeer Ghazt** " (2020) (15). "**Heba Saad** " (2019) (24) and "**Sayed Yassin Hassan** " (2018) (5) study, "**Carpenter** " (2018) (25) , and "**Mohammed Darwish** " (2016) (21) , **Nohamoh** (2015) (28), and since we are living in a technological revolution, we find that hybrid education has taken on different roles from the past as a result of the Corona pandemic, which the country went through and led searching for a method or a technological technique that could overcome crowds, and this is what prompted the researchers to think about the use of a modern teaching method that relies on a sophisticated

technological technique, namely, the infographic in the learning process to teach a physical education course, where the infographic technology helps to form the mental image of the skills to be developed and the knowledge information associated with them to help with achieving the desired educational goals in the least time and effort by communicating complex information in a smooth way adding the elements of fun and suspense in the educational process. Accordingly, the researchers conducted a study that they called "The effect of the infographic method on learning some offensive skills in handball for students of the second cycle of basic education".

Search objective:**The current research aims to:**

Recognizing the effect of the infographic method on learning some offensive skills (grabbing and receiving the ball - dribbling - passing - the ballistic correction of stability and movement) in handball for students of the second cycle of basic education at the Nile Egyptian School, Minya Branch.

Research hypotheses:

In light of the research objective, the researcher puts forward the following hypotheses:

- 1 - There are statistically significant differences between the mean scores of the pre and post measurements of the experimental group in the skill tests under study and in favor of the post measurement .
- 2 - There are statistically significant differences between the mean scores of the pre and post measurements of the control group in the skill tests under study and in favor of the post measurement.
- 3 - There are statistically significant differences between the mean scores of the two pre and post measurements for the experimental and control groups in the skill tests under study and in favor of the experimental group .

Terms included in the search:**Infographic:**

It is the art of transforming complex data, information and concepts into images and graphics that can be understood both clearly and interestingly, this style is characterized by presenting complex and difficult information in a smooth, easy, and clear manner (9 :3).

Research plan and procedure:**Research Methodology :**

The researchers used the experimental method due to its relevance to the nature of the research using the experimental design for two groups, one experimental and the other is a controlled group, by following the pre and post measurements for both groups.

Research sample and community:

The research community includes students of the second preparatory grade at the Nile Egyptian School, Minya Branch, for the 2021/2022 academic year, the first semester, totaling (52) fifty-two students. The researchers selected a random sample of (34) thirty-four students representing a percentage of (65,38%) of the research community. They were divided into two groups, one of them is experimental and uses the educational program (Infographic style) and the other is a controlled one that uses the traditional method. Each group consists of (17) seventeen students. The researchers also used (16) students from the same research community and similar to the research sample as an exploratory sample, in order to conduct exploratory experiments, and (2) two people with special needs and patients.

The average distribution of the sample members:

The researchers made sure of the moderation of the distribution of the members of the experimental and controlled groups under consideration in light of the following variables: growth rates (age, height, weight), intelligence and skill tests, and table (1) illustrates this .

Table (1)
Arithmetic mean, median, standard deviation, and skew coefficient of
growth rates (age - height - weight) and intelligence
The tests and skills of the sample members as a whole are under
investigation (n = 34).

Variables	measruing unit	group led control				experimental group			
		SMA	standard deviation	Mediator	skew modulus	SMA	standard deviation	Mediator	skew modulus
Age	Year	13,06	7 ÷ 0	14	1,71-	13,53	1,01	14	1.4-
height	cm	158,35	6,37	158	16 ÷ 0	157,82	6,43	158	0,22-
weight	kg	57,35	14,29	53	91 ÷ 0	56,65	11,30	53	97 ÷ 0
intelligence	Degree	69,59	9,29	68	51 ÷ 0	68,94	8,80	68	32 ÷ 0
Passing and receiving in seconds 30	Number	9,9	1,3	10	23 ÷ 0-	9,7	1,2	10	75 ÷ 0-
Bouncing the ball in a zigzag for a distance of m15	second	14,3	1,5	14	6 ÷ 0	11,4	5,9	10	71 ÷ 0
Scrolling and receiving in a rectangular shape	Number	2,06	83 ÷ 0	2	22 ÷ 0	2,24	1,2	2	6 ÷ 0
Shooting from stability balls) from the 9 m 10) line	Number	3,4	1,8	4	1 ÷ 0-	3,6	1,7	4	71 ÷ 0-

It is evident from table (1) that:

The values of the skew coefficients of growth rates, intelligence and skill variables for the controlled and experimental groups ranged between (-1.71: 0 , 97), meaning that they were limited to (± 3), which indicates the moderation of the distribution of the two groups in those variables .

Data collection tools:

First: Tools and equipment :

Indicative tools of growth rates (age - height - weight), medical scale to measure weight (to the nearest kilogram) , stopwatch (to the nearest second) , smart board, infographic software.

Second: IQ test :

IQ test (nonverbal) for the age group (11-15) years

The researchers used the "pictorial intelligence (nonverbal) test" that is prepared by Prof. Yasirah Muhammad Abu Hadros. It is considered to be one of the modern tests. This test aims to measure the level

of intelligence from the age of (11-15), and it is a non-verbal test that does not depend on words or writing, and it consists of (39) items.

Third : skill tests:

The skill tests were determined based on theoretical readings and specialized scientific references such as “ Samer Mahdi ” (2019) (12), “ Fatima Abu Al-Qasim ” (2017) (17), Ahmed Shawky (2016) (2), Radwan Mustafa ” (2016) (11) Those tests (attachment 1) were presented to a group of experts in the field to ensure their suitability for measuring these variables and their compatibility with the age group under study. Through this, the researchers reached the skill tests, which are: passing and receiving in 30 seconds, bouncing the ball in a zigzag line for a distance of 15m, shooting from stability (10 balls) from the 9 m line, passing and receiving in a rectangular shape. The researchers calculated the scientific coefficients for those tests (attachment 2).

The infographic method under consideration: Index (3)

The researchers Determining the components of the method according to the scientific basis:

General goal:

It aims to learn the skills of (grabbing and receiving the ball - passing - dribbling - kicking ball from stability and movement) in handball and the cognitive information associated with it according to the requirements of the educational process for the preparatory stage.

The content:

The proposal under consideration includes the following:

An introduction to the skill (under research), technical and educational steps (under research), handball skills under research: 1- catching and receiving the ball 2- passing, 3- dribbling 4- kickboxing from stability and movement , information and knowledge related to the skills (under research) handball infographic (under research).

5- The necessary capabilities for implementation:

The capabilities for implementation include the tools and devices that the researchers will use, and the educational material that will be included in the educational software. These capabilities are as follows :

A- Tools and equipment, including:

Computer Lab and computer devices, smart board, CDs, infographic software .

B- The educational material including the following:

Pictures of skills and information in infographics, written text, audio commentary, music, and sound effects.

6- The teaching method used:

The researchers used the infographic method.

7- General framework of use:

The program is implemented through a physical education lesson with one teaching unit per week, and the teaching unit time is (50) minutes during the first semester according to the study plan .

8- Assessment methods:

Skill tests.

Seventh: Infographic software:

The infographic software under discussion is the main axis around which the current research topic revolves. The programming process went under many stages before being shown in its final form. (Attachment 4).

The survey:

After completing the design and production of the software, the researchers tested the software in its final form on a sample of (16) students from the research community and from outside the original sample on Sunday 12/09/2021 in an actual academic context to evaluate the educational content to ensure its suitability to the students, the time specified for the teaching unit, the appropriateness of the arrangement of the teaching unit, and the validity of the devices and tools used in the research.

Search application steps:**Premeasurement:**

The pre-measurement was performed on the two research groups in the period from Sunday 26/9/2021 to Wednesday 29/9/2021 in the variable (skill tests) under study .

Basic Experiment:

The researcher after the completion of the pre-measurement started to conduct the basic experiment on the experimental group for a period of (12) weeks, from 3/10/2021 to Thursday, 23/12/2021.

Post-measurement:

The researchers conducted a post-measurement immediately after the completion of the experiment for the controlled and experimental groups in the variables under consideration, in the period from Sunday, corresponding to December 26, 2021, to Wednesday, December 29, 2021, using the same method and under the same pre-measurement conditions .

Statistical method used:

The researchers used the statistical coefficients:

Arithmetic mean - median - standard deviation - skew coefficient - correlation coefficient – T-tests, coefficients of ease and difficulty, Mann Whitney Parametric, relative weight, percentage change .

Presentation and discussion of results:-**First: Results showings:****Table (2)**

The significance of the differences between the mean of the pre and post measurements of the experimental group in skill tests under investigation (n = 17)

variable	measuring unit	Premeasurement Average	Post measurement Average	average differences	deviation from mean	T value	level indication
seconds Passing and receiving in 30	Number	4,69	11,29	6,71	3,48	7,95	D
Bouncing the ball in a zigzag for a distance of 15m	second	9,88	15,35	5,47	2,96	7,62	D
Scrolling and receiving in a rectangular shape.	Number	2,24	10,94	8,71	2,95	12,16	D
Shooting from stability (10 balls) the 9 m line from	Number	3,41	7,65	4,24	2,28	7,66	D

2,12The value of tabular (T) at the degree of freedom (16) and level of significance of (0.05)=

It is evident from table (2) that:

There are statistically significant differences between the mean of the pre and post measurements of the experimental group and the skill tests under study in favor of the post measurement.

Table (3)

The significance of the differences between the mean of the pre and post measurements of the controlled group in the skill tests under study (n = 17)

variable	measuring unit	Premeasurement Average	Post measurement Average	Average differences	deviation from mean	T value	level indication
Passing and receiving in 30 seconds	Number	4,82	8,82	4,00	3,54	4,67	D
Bouncing the ball in a zigzag for a distance of 15m	second	9,71	12,06	2,35	1,50	6,48	D
is in a and receiving scroll rectangle	Number	2,06	7,06	5,00	1,77	11,66	D
Shooting from stability (10 balls) from the 9 m line	Number	3,59	5,53	1,94	1,92	4.17	D

The value of tabular (T) at the degree of freedom (16) and level of significance of (0.05)= 2,12

It is evident from Table (3) that:

There are statistically significant differences between the mean of the pre and post measurements of the control group in the skill tests under study in favor of the post measurement.

Table (4)

The significance of the differences between the mean scores of the two pre-measurements for the experimental and control groups in the skill tests under study (n = 34)

variable	controlled group		experimental group		T value	Indication level
	M	p	M	p		
Passing and receiving in 30 seconds	8,82	1,95	11,29	2,25	3,34	D
Bouncing the ball in a zigzag for a distance of 15m	12,06	1,08	15,35	2,21	5,39	D
Scrolling and receiving in a rectangle	7,06	1,51	10,94	2,27	3,40	D
Shooting from stability (10 balls) from the m line 9	5,53	,95	7,65	1,2	6,42	D

The value of tabular (T) at the degree of freedom (32) and the level of significance 0,349(0.05) =

It is evident from Table (4) that:

There are statistically significant differences between the mean of the two post measurements of the experimental and control groups in the skill tests under study and in favor of the experimental group.

Table (5)

Percentages of the rate of change in the handball skill tests for the control and experimental groups under study

variable	measuring unit	experimental group			control group		
		Pre-measurement Average	Post-measurement Average	Change Rate %	Pre-measurement Average	Post-measurement Average	Change Rate %
receiving in 30 seconds	Number	4,69	11,29	%151,38	4,82	8,82	%82,99
Bouncing the ball in a zigzag for a distance of 15m	second	9,88	15,35	%55.36	9,71	12,06	%24,20
Scrolling and receiving in a rectangle	Number	2,24	10,94	%388.3	2,06	7,06	%242,72
from stability (10 balls) Shooting m line from the 9	Number	3,41	7,65	%124.34	3,59	5,53	%54,04

It is evident from table (5) that:

There is a difference in the percentages of change in the skill tests for handball under discussion for the controlled and experimental groups, where the percentage of change for the control group ranged between (24.20% : 242.72%), and the percentage of change for the experimental group ranged between (55.36% : 388.3%) Thus, the experimental group obtained higher rates of change than the control group, which indicates the effect of the proposed program in improving those variables .

Second: Interpretation and discussion of the results:

Through the objectives and hypotheses of the research and within the limits of the research sample and from the reality of the results that were reached through statistical treatment, the researcher reached the following: **It is clear from Table (2) that there are statistically significant differences between the mean of the pre and post measurements of the experimental group and the skill tests under study in favor of the post measurement .**

The researchers attribute that to the positive influence of the fixed infographic where it displays the entire content in one image that gives students a comprehensive perception of the subject, and this is consistent with the assumptions of the "Gestalt theory" that learning depends on sensory perception, that is, all perceptions stored in memory are recognized and entered into memory by the senses, and that learning is the process of reorganizing knowledge as it depends on understanding the relationships that constitute the problem or the educational situation by reorganizing them to indicate their meaning. This is consistent with the study of' Nohamohd "2015 (27), which recommended the need to strengthen the infographic as one of the reliable tools to overcome

learners' problems, as well as to use it as a tool that helps transform complex data into an understandable visual presentation.

The researchers believe that the use of infographics led to a faster absorption for the students and understanding the information related to the skills under research. The researchers also attribute this progress to the members of the experimental group to the fact that the fixed infographic worked to simplify the information and this helped the students to remember it, organize it and treat it in an easy way, which led to the consolidation of information and concepts for a long period of time, and this is consistent with what “**Fatima Abu Al-Qasm**” (2021) (17) that graphic design develops the ability to remember, retrieve information, better use the brain, and create relationships between variables and the link between them.

The researchers also see that the fixed infographic and its provision of complete and simplified information greatly contributed to increasing the students' motivation and interaction with the handball skills under study and achieving the process of acquiring more information, which had a positive impact on the skill level of the students “**Heba Saad**” (2019) (24), the study of “**Mohammed Darwish**” (2016) (21), and the study of “**Seham Al-Jeriwi**” (2014) (13) where the most important results of their study indicated that the fixed infographic has a positive effect on the mastery of the skills under study. Thus, the first hypothesis of the research has been achieved.

It is evident from Table (3) that:

There are statistically significant differences between the mean of the pre and post measurements of the controlled group in the skill tests under study in favor of the post measurement.

The researchers believe that the motor skills in handball affect the improvement of physical abilities and enhance the target motor abilities. This is consistent with “**Kamal Suleiman and others**” (2017) (18) that it is one of the most important and most sensitive pillars, as it usually takes the longest time in the program, and it also obtains the greatest interest is indispensable for the novice or advanced players, as the nature of performance in handball depends to a large extent on the player's competence to perform the basic skills, whether offensive or defensive, and employ those skills during the implementation of the tactical work and requires the player's mastery of the various skills.

The researchers attribute this result to the fact that the traditional method presented good information related to the skill aspects, as well as its

explanation of the method of performance of the handball skills in question, and its mention of the technical aspects related to performance and its repetition.

The researchers also attributed this progress to the commitment of the students of the controlled group in attendance, non-absence, and continued practice and learning, a positive effect on the efficiency of skill performance, in addition to forming a good motor perception of the learned skill of the students of the controlled group. The traditional method (explanation and model performance) has a positive effect on the skills "under study". Thus, the second hypothesis of the research has been achieved. Which states that "there are statistically significant differences between the mean scores of the pre and post measurements of the controlled group in the cognitive achievement and the skill tests under study and in favor of the post measurement .

It is evident from Table (4) that there are statistically significant differences between the mean of the two pre-measurements of the experimental and controlled groups in the skill tests under study and in favor of the experimental group.

The researchers attribute the achieved results to attracting the attention of the learners and excitement and motivation towards the learning process, interpreting abstract information, and accurately representing skills, so there is a need to employ Infographic in the educational process. This is consistent with the study of " **Rasha Yahya**" (2022) (10), which indicated that acting a visual infographic contributed positively to learning the skills under discussion in the folk dance of the experimental group, and the visual representation in the infographic was superior to the style of the traditional approach to learning the skills under study, which indicates its effectiveness and positive impact on the educational process.

The researchers believe that the improvement of the skillful performance of handball of the experimental group of students is attributed to the fixed infographic which presents the content in an attractive way and focus on the most important information and data, which is consistent with what **Gebre (2018)** that the infographic representation provides students with good educational environment through illustrations and text, to attract students' attention and increase their motivation to discover the

information provided by the infographic, make students think about what they see, retain and retrieve that information while applying skills in practical actual matches, a tool for building knowledge and ideas and understanding relationships and various phenomena, through drawings, shapes, and fixed and interactive images, which help to consolidate and embody different concepts and knowledge in the mind of the learner, and make them interesting and more effective . (29:44).

The researchers also attribute the progress of the students of the experimental group over the students of the controlled group in learning the handball skills in question to the positive effect of using the fixed infographic, as it gave the students the opportunity to build a motor and informational perception of the method of performing motor skills, and this made the students more motivated to learn and more eager to do more. Effort to achieve the best performance which is consistent with the study of " **Islam Raafat** " (2021) (3), where one of the most important results was that the use of infographics through the proposed educational program contributed in a positive and effective way to improving achievement in cognitive and skill level for some ball skills in rhythmic art exercises.

The researchers believe that the content of the infographic under consideration considers the specific educational objectives, which are clear and consistent with the objectives of the course, as well as with the level and abilities of the students. It provided clear, scientifically correct, and linguistically sound content, away from unimportant details, modern, from reliable sources, clear and covering all parts of the idea that fits the design with the characteristics of the learners, their experiences, and their previous backgrounds . This is consistent with what was indicated in the study of “ **Ahmed Rahim, Ziyad Salem** ” (2020) (1) and the study of “ **Iman Ibrahim**” (2020) (6) and the study of “ **Ghadir Ezzat** (2020) (15).

The researchers also attribute this progress to the fact that the infographic took into account the individual differences between the students and contributed to arousing the motivation towards more learning and created a kind of enthusiasm and competition required during the practical application of the skills under study , and this was not available to the controlled group and this is consistent with what the results indicated in

the study of “**Mashaal Khalil**” (2021) (23), “**Islam Raafat** ” (2021) (2), “**Muhammad Jamal** ” (2021) (20), “**Mohammed Darwish** ” (2016) (21), the study of “**Ghadir Ezzat** ” “(2020) (15), “**Hasnain Nagy, Walaa Gabbar** ” (2020) (8) “**Carpenter** ” (2018) (25) “**Nohamohd** ” (2015) (27) , “**Pinar.N & Buketm.A.** (2014) (30) about the effectiveness of fixed infographics as an educational tool in teaching and learning different academic courses.

It is evident from Table (5) that there are differences in the percentage of change between the two measurements before and after for the experimental and controlled groups in the handball skill tests under discussion .

This indicates the percentage of change in the skill tests for handball under discussion for the control and experimental groups, where the percentage of change for the control group ranged between (24.20% : 242.72%), and the percentage of change for the experimental group ranged between (55.36%: 388. 3%) and therefore the experimental group obtained higher rates of change than the controlled group, which indicates the effect of the proposed program in improving those variables, and thus we find that the highest percentage of improvement was in favor of the experimental group.

The researchers believe that the skill improvement of the research sample to the use of the infographic and its clear impact on the experimental sample of the ball in exercising rhythmic art, which is consistent with the study of “**Mohammed Gamal** ” (2021) (20) on some basic motor skills in athletic games for children, and the study of “**Ghadir Ezzat**” (2020) (15) on learning some ballet skills, study " **Hasnain Nagy, Walaa Gabbar**" (2020) (8) on learning the skill of serving in volleyball for students. Thus, the third hypothesis of the research was achieved, which states that "there are statistically significant differences between the mean scores of both pre and post measurements of the experimental and controlled groups in the skill tests under study and in favor of the experimental group.

Conclusions and recommendations :

Abstracts :

- 1- The educational program using infographics contributed better than the traditional method in learning some offensive skills in handball.
- 2- The experimental group that used the educational program in an infographic style outperformed the control group that used the traditional method (explanation and model performance).
- 3- The use of the picture in the infographic technique stimulated the students to interact and this led to their eagerness and interaction in learning the skills.

Recommendations:

- 1- Holding training courses for physical education teachers to familiarize them with how to design, build and implement training programs based on infographic technology and based on self-learning methods.
- 2- Conducting similar studies on different sports activities at various age levels to keep pace with development and raise educational efficiency.
- 3- Expand the application of the use of infographics in various academic subjects.

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