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Original Article

The Effect of Using an Educational Booklet Supported By QR Code On Cognitive Achievement Level and Some Basic Skills in Soccer of PE Female Students

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Abstract

The research aims to identifying the effect of using an educational booklet supported by a QR code on the level of cognitive achievement and some basic skills in soccer for female students of the Faculty of Physical Education. The researcher used the experimental method and the experimental design with pre- and post-measurements for two experimental and control groups. The first-year students of the Faculty of Physical Education, Sadat City University, participated in it for the academic year 2023/2024.The most important results were that the proposed educational program had a positive impact on the level of cognitive achievement and some basic skills in soccer for female students. Researchers recommend using Educational Booklet that supported by QR Code in the educational process.

Keywords: *Educational booklet, QR code*, Soccer

Introduction

The educational process in the field of physical education and sports sciences is currently evolving in response to the demands of the modern era. The continuous development of mobile device technologies and their widespread use in recent years have created new opportunities for their integration into education. One such innovation is mobile learning, which has emerged as a significant component of distance education. It represents a convergence of mobile device technologies with e-learning and remote education systems, offering educational experiences unrestricted by time or location. Mobile learning serves as a link between learners and educational tools, aiming to achieve instructional goals and address learning challenges.

Diaa Mutawa and Hassan Al-Khalifa (2015) emphasize that teaching methods are among the most critical pillars in achieving the goals of the educational process. As a result, various instructional approaches have been developed that place the learner at the center of the educational experience. These methods, supported by modern educational technologies, encourage students to engage in diverse cognitive and personal activities, ultimately aiming to enhance the quality of educational outcomes. (Mutawa, D., & Khalifa, H., 2015)

Lal M. and Singh R. (2011), along with Saravani and Clayton (2009), argue that communities and educational institutions are now compelled to seek innovative educational technologies and approaches to keep pace with ongoing developments and to leverage them in the teaching and learning process. Among these technologies, which emerged in the mid-1990s with the evolution from Web 1.0 to Web 3.0, is the Quick Response (QR) Code. This technology represents an advanced form of the traditional linear barcode, offering higher data capacity and a more sophisticated format. QR codes can be decoded and accessed through dedicated applications available on mobile phones. (Lal, M., & Singh, R., 2011; Saravani, S. J., & Clayton, J., 2009)

Muhammad Atta (2017) highlights that one of the key advantages of the Quick Response (QR) Code is its widespread availability and accessibility through various platforms. This contributes to enriching the educational environment and motivating learners, as it primarily depends on the learner's active participation. QR codes help save time and effort, enhance students' abilities, increase motivation to learn, and cater to individual learning differences. Their use in educational contexts enables differentiated instruction by providing targeted support to both high-achieving and struggling students. QR codes offer effective and immediate solutions to educational challenges, minimizing the anxiety some students may feel when seeking clarification from teachers. (Atta, M. M., 2017)

The integration of QR codes into education—especially within printed materials—represents a multi-web technology that allows learners to access digital resources and multimedia content directly from physical classroom materials. (Saravani, S. J., & Clayton, J., 2009)

Moreover, the use of QR codes adds interactive dimensions to educational situations by incorporating audio clips, videos, and website links. These features enhance student engagement and make the learning experience more dynamic. (Abdel Moneim, M. A., 2012)

Hassan Abu Abdo (2016) notes that technical preparation in football aims to teach and master fundamental skills required during matches and competitions. These basic skills are foundational elements of daily training and critical for executing tactical plans. Learning such skills involves modifying the player's technical behavior—a process influenced by the learner's personality and readiness. Motor learning, therefore, extends an individual's physical, mental,

and psychological capabilities and must be guided appropriately to improve technical performance in football. (Abu Abdo, H. A. S., 2016)

From the above, the importance and effectiveness of using modern technological tools in education become clear. Educational booklets enhanced with QR codes are among the latest instructional innovations in educational technology. They can contribute positively to the acquisition of specific football skills. By scanning the QR code linked to a particular skill, students can independently access instructional videos that demonstrate technical execution, explain teaching steps, and identify common mistakes.

This allows students to revisit skill demonstrations both during and outside class sessions, tailoring the learning pace to their individual needs. These resources are particularly valuable in abstract or complex topics that are hard to grasp through text and images alone.

At the Faculty of Physical Education – Sadat City University, it has been observed that most textbooks and curricula available to female students consist primarily of printed text with a few illustrations. This makes it difficult for some students to understand practical components, especially in football courses that require physical demonstration. Consequently, the researchers proposed the development of an educational booklet supported by QR codes, considering numerous studies validating their effectiveness in educational contexts.

This initiative led to the present study, which aims to scientifically assess the impact of using a QR-code-enhanced educational booklet on the cognitive achievement and practical football skills of female students at the College of Physical Education.

The research aims to design an educational program using a QR code-supported educational booklet and to investigate its effect on the level of cognitive achievement and the development of some basic football skills among female students of the Faculty of Physical Education.

Study Hypotheses

1. There are statistically significant differences between the averages of the pre- and Post-test of the experimental group in the level of cognitive achievement and some basic skills in football for female students, in favor of the post-measurement.
2. There are statistically significant differences between the averages of the pre- and Post-test of the control group in the level of cognitive achievement and some basic skills in football for female students, in favor of the post-measurement.
3. There are statistically significant differences between the averages of the two Post-test of the two groups (experimental - control) in the level of cognitive achievement and some basic skills in football for female students, in favor of the post-measurement of the experimental group.

Materials and Method

The researchers used the experimental method using the experimental design with pre- and Post-test for two experimental and control groups due to its suitability to the nature of the research.

Participants

The research community was selected intentionally from First year female students at the Faculty of Physical Education, Sadat City University for the academic year 2023/2024. The number was (820) student. The research sample was selected intentionally from the research community, and its number reached (100) student of the total Research community.

Table 1. Classification of the research sample for the study groups

Sample	Research groups	Number
Basic	Experimental group	40
	Control group	40
Survey group		20
Total		**100**

It is clear from Table (1) that the total basic sample amounted to (80) student while the survey sample reached (20) student of the total Research community and outside the basic sample individuals.

Homogeneity of the participant Groups

To ensure that the research sample falls under the normal curve and thustoModerate distributiontoUsing skewness coefficients to find the homogeneity factor for the basic, experimental and exploratory study variables, which is clear from the following table.

Table 2. The normality of the research sample distribution (Experimental - Control - Exploratory) In growth variables and intelligence level (n = 100)

Variable	Unit	Mean	Median	SD	Skewness
Age	years	18.645	19,000	0.786	1.035
Height	Cm	162.205	162,000	3.865	0.401
Weight	Kg	60,890	61,000	5,049	-0.166
Intelligence	Deg	37.160	37,000	3,570	0.190

It is clear from the results of Table (2) Moderate distribution Research sample individuals (experimental - control - exploratory) in Growth rates (age, height, weight)And the level of intelligence, where the values of the skewness coefficient were limited between (±3), where it ranged between (-0.166, 1.035)Which indicates that the research sample individuals

fall under the moderate curve. The sample members were distributed moderately and homogeneously in terms of growth rates and intelligence.

Table 3. The normality of the research sample distribution (Experimental - Control - Exploratory) In growth variables and intelligence level (n = 100)

Variables		Mean	The median	Standard deviation	Skewness
Physical	Speed (Sec)	5.655	5.520	0.691	0.252
	Flexibility (Cm)	8.156	8,300	1.247	-0.307
	Agility	32.893	32.935	2.360	-0.018
	Coordination (Sec)	10.566	10.440	1.562	-0.621
Basic skills	Running with the ball in a straight line (Sec)	17,421	17,535	2.564	-0.311
	Throw-in(m)	6.144	5.835	1.256	0.241
	kick the ball farther (m)	17,597	17,520	2.885	-1.453
	Shooting accuracy (Deg)	4.075	4,000	0.753	0.011
Cognitive achievement		14,650	15,000	3.483	0.365

It is clear from the results of Table (3) Moderate distribution Research sample individuals (experimental - control - exploratory) in Physical and skill variables and the level of cognitive achievement of the samples under study, where the values of the skewness coefficient were limited between (±3), where it ranged between (0.011,- 1.453)Which indicates that the research sample individuals fall under the moderate curve .The sample individuals were distributed in a moderate and homogeneous manner.

Equivalence of the participant Groups

To ensure the equivalence of the two research groups in terms of the basic and experimental variables under study and to control any potential differences between them. The researcher conducted a statistical analysis to determine the level of homogeneity between the groups. The results of this equivalence test are presented in the following table.

Table 4. The significance of the statistical differences of growth variables and intelligence level of the two groups (experimental and control) (n1=n2=40)

Variables		Control group		Experimental group		difference between averages	value (T)*	Sig.
		Mean	SD	Mean	SD			
Growth	Age (year)	18,638	0.768	18,763	0.891	0.125	0.672	0.504
	Height (Cm)	161.875	3.665	162,87	4.224	0.995	1.125	0.264
	Weight (Kg)	60.275	4.951	61,475	4.956	1,200	1.083	0.282
IQ level (Deg)		37,050	4.495	37.150	2.940	0.100	0.118	0.907

* Tabular (T) at 0.05 and degree of freedom (78) = 1.994

Table 5. the significance of the statistical differences in the physical and skill variables and the cognitive achievement of the groups (experimental and control) (n1=n2=40)

Variables		Control group		Experimental group		difference between averages	value (T)	Sig.
		Mean	SD	Mean	SD			
Physical variables	Speed (Sec)	5.667	0.833	5.692	0.613	0.025	0.153	0.879
	Flexibility (Cm)	8.128	1.342	8,180	1.138	0.053	0.189	0.851
	Agility	33,00	2.044	32,830	2.674	-0.171	-0.320	0.750
	Coordination (Sec)	10.6	1.676	10.526	1.315	-0.072	-0.212	0.832
Basic skills	Running with the ball in a straight line (Sec)	17,36	2.511	17.405	2.517	0.043	0.077	0.939
	Throw-in(m)	6.202	1.324	6.073	1.226	-0.129	-0.452	0.652
	kick the ball farther (m)	17.13	3.510	17.915	2.665	0.788	1.131	0.262
	Shooting accuracy (Deg)	4.063	0.700	3.875	0.766	-0.188	-1.143	0.256
Cognitive achievement (Deg)		14,75	3.65	14,35	3.527	-0.400	-0.498	0.620

It is clear from Table No. (5) There were no statistically significant differences between the growth rates, intelligence level, physical and skill tests, and cognitive achievement level of the experimental and control groups, as the calculated “t” value ranged from (0.077: -1.143) which is less than the tabular “t” value at a significant level of 0.05, indicating the equivalence of the two groups in the variables.

The researchers reviewed specialized scientific references and websites, referring to key studies such as those by Abu Abdo, H. (2016), Saeed, L. (2018), Taha, M. (2020), Ali, M., & El-Gilani, M. (2002), Saher, A. (2002), Naja, S. M., & El-Gilani, M. A. (2004), and Shalaby, R. (2006). The aim was to identify the appropriate tools, devices, and tests for the research, as detailed below:

- Computer
- Mobile phones.
- Registration Form
- A questionnaire form for experts’ opinions on the validity of the educational program using the educational booklet supported by the QR code

The tests of the study

1. Physical tests
   - 30m high start sprint test (to measure transition speed)
   - Forward-down trunk flexion test (to measure flexibility)
   - Barrow test (to measure agility)
   - Testing of numbered circuits (to measure compatibility).

2. Skill tests
   - Ball running test in a straight line.
   - Longest throw-in test
   - Test of kicking the ball as far as possible from a fixed position
   - Testing the accuracy of shooting on the divided goal
3. IQ test (Prepared by Jaber Abdel Hamid, Mahmoud Ahmed Omar (2007), a verbal intelligence test for high school and university.
4. Cognitive achievement test (Prepared by the researcher)

After reviewing many studies and studies that were conducted in the field of football and learning about the steps of constructing the test and its scientific coefficients and the method of formulating the questions used, and in light of that, the researcher prepared the cognitive test in its initial form. The test included three axes (history - law - skills) The test includes two types of questions (true or false, multiple choice) and includes 70 items. It was presented to a group of experts in the fields of football, curricula, and methods of teaching physical education from professors at the faculties of physical education in the Arab Republic of Egypt. and the necessary amendments were made according to the opinion of the experts, and based on that, it became “60” words, as (10) words were deleted, and it was presented to them again, and one mark was determined for each question.

Table 6. Cognitive Achievement Test Time

Experimental response time		Total time	The needed time
First student	Last student		
30 minutes	40 minutes	70 minute	35 minutes

To calculate the test time in its final form, the researcher calculated the experimental time, which is the time taken by the first and last students to answer the test in its final form. Then the time taken by the first and last students was added and divided by two to extract the arithmetic mean of the test time, which is the appropriate time to answer the test. As shown in Table (6).

It is clear from the table (6) The appropriate time to answer the cognitive achievement test in its final form is 35 minutes.

It is clear from Table (7) that the ease coefficients for the cognitive test under study ranged between (0.15: 0.85), the difficulty coefficient ranged between (0.15: 0.85), and the distinction coefficient ranged between (0.16: 0.25).

Table 7. Ease, Difficulty and Discrimination Coefficients of the Cognitive Test Items

Phrase Nr	Ease factor	Difficulty factor	discrimination coefficient	Phrase Nr	Ease factor	Difficulty factor	discrimination coefficient
1	0.30	0.70	0.21	**31**	0.50	0.5	0.25
2	0.40	0.60	0.24	**32**	0.60	0.40	0.24
3	0.35	0.65	0.25	**33**	0.35	0.65	0.23
4	0.15	0.85	0.13	**34**	0.20	0.80	0.16
5	0.85	0.15	0.13	**35**	0.55	0.45	0.25
6	0.30	0.70	0.21	**36**	0.60	0.40	0.24
7	0.25	0.75	0.19	**37**	0.35	0.65	0.23
8	0.85	0.15	0.13	**38**	0.35	0.65	0.23
9	0.40	0.60	0.24	**39**	0.45	0.55	0.25
10	0.35	0.65	0.23	**40**	0.35	0.55	0.25
11	0.23	0.76	0.18	**41**	0.55	0.45	0.25
12	0.40	0.60	0.24	**42**	0.50	0.50	0.25
13	0.35	0.65	0.24	**43**	0.40	0.60	0.24
14	0.30	0.70	0.27	**44**	0.40	0.60	0.24
15	0.23	0.72	0.17	**45**	0.15	0.85	0.13
16	0.30	0.70	0.21	**46**	0.25	0.75	0.19
17	0.40	0.60	0.24	**47**	0.45	0.55	0.25
18	0.32	0.63	0.20	**48**	0.70	0.30	0.21
19	0.52	0.41	0.21	**49**	0.35	0.65	0.23
20	0.35	0.65	0.23	**50**	0.30	0.70	0.16
21	0.25	0.75	0.19	**51**	0.65	0.35	0.23
22	0.30	0.70	0.21	**52**	0.35	0.65	0.23
23	0.35	0.65	0.23	**53**	0.25	0.75	0.19
24	0.20	0.80	0.16	**54**	0.85	0.15	0.13
25	0.25	0.75	0.19	**55**	0.30	0.70	0.21
26	0.30	0.70	0.21	**56**	0.55	0.45	0.25
27	0.40	0.60	0.24	**57**	0.40	0.60	0.24
28	0.35	0.65	0.23	**58**	0.35	0.65	0.23
29	0.55	0.45	0.25	**59**	0.25	0.75	0.19
30	0.35	0.65	0.23	**60**	0.30	0.70	0.21

Pilot Studies

The exploratory study was conducted during the period from Monday 10/2/2023 until Monday 10/9/2023, on the exploratory research sample members, numbering (20) female students from the research community, and from outside the main sample, and aimed to identify the following:

- The suitability of physical, skill and cognitive achievement tests for the research sample members.
- Validity of the tools and devices used in measurement.

- Identify the difficulties that researchers may face when implementing the basic experiment and work to overcome them before application.
- Conducting scientific transactions (validity and reliability) for the tests under study.

Validity of the tests

Validity was calculated by means of one-way comparison validity by identifying the significance of statistical differences between the upper and lower quartiles of the scores of the individuals in the survey sample under study.

It is clear from Table No. (8) There are statistically significant differences between Upper and lower springs of the survey group in Intelligence level, physical and skill tests, and cognitive achievement level, where the calculated "t" value ranged (6.368:16,000) and it is greater from the tabular "t" value at a significant level of 0.05, which indicates the validity of these tests for what they were designed for.

Table 8. Significance of statistical differences between the upper and lower quartiles of all studied tests' results (n1=n2=5)

Variables		Upper Quartile		Lower Quartile		Diff. of Mea	T value	Sig.
		Mean	SD	Mean	SD			
Physical	Speed (Sec)	6.228	0.168	4.986	0.301	1.242	8,069	0.000
	Flexibility (Cm)	9,600	0.212	6,300	0.539	3,300	12,75	0.000
	Agility	35,776	0.680	30.214	0.162	5.562	17,79	0.000
	coordination (Sec)	12.678	0.771	8.146	1.392	4.532	6.368	0.000
Basic skills	Running with the ball in a straight line (Sec)	20.988	0.829	13,768	1.208	7.220	11.02	0.000
	Throw-in(m)	7.950	0.505	4.920	0.501	3.030	9.519	0.000
	kick the ball farther (m)	20.144	0.808	16.14	1.216	4,000	6.126	0.000
	Shooting accuracy(Deg)	5.100	0.224	3,500	0.000	1,600	16,00	0.000
CollectionCognitive (Deg)		18,800	1.095	10,80	1.095	8,000	11,55	0.000
IQ Test (Deg)		41,000	1,000	34,40	1.342	6,600	8,820	0.000

*Tabular (T) at 0.05 and degree of freedom (8) = 2.306

Reliability of physical tests

The reliability coefficient of the physical tests was calculated using the test-retest method. Test and re-test on a sample of (20) female students from the first year from the same community as the research sample and outside the basic research sample, the researcher considered the results of the tests for the validity of the distinguished group as the first application.

Then the retest of the physical and skill tests and the intelligence test under the same conditions and with the same instructions after (7) days from the first application, on Monday,

October 9, 2023, and the following table shows the correlation coefficients between the two applications

Table 9. Correlation coefficient between the first application and the second application of the survey sample in all used tests (n=20)

Variables		Test		Re-Test		Correlation coefficient
		Average	SD	Average	SD	
Physical variable	Speed (Sec)	5.561	0.527	5.612	0.486	0.989**
	Flexibility (Cm)	8.165	1.320	8.175	1.293	0.774**
	Agility	32.803	2.391	33,097	1.801	0.714**
	Coordination (Sec)	10.582	1.843	10.652	1.216	0.652**
Basic skills	Running with the ball in a straight line (Sec)	17.575	2.878	17.635	2.869	0.805**
	Throw-in(m)	6.170	1.231	6.255	0.938	0.854**
	kick the ball farther(m)	17,900	1.651	18.168	1.467	0.685**
	Shooting accuracy (Deg)	4,500	0.688	4,700	0.657	0.698**
CollectionCognitive (Deg)		15,050	3.154	15,500	2.351	0.635**
levelIntelligence (Deg)		37,400	2.664	37,550	2.373	0.888**

**The (r) tabular value at 0.05, and a degree of freedom of (n-2) (18)= 0.44

It is clear from Table No. (9) There is a statistically significant correlation between the application and reapplication of the tests. Physical Skill, intelligence level and cognitive achievement" Under investigation", where the correlation coefficient ranged between (0.652: 0.989) which It indicates the stability of this Tests.

QR Code Tutorial

- The researcher designed the program using an educational booklet supported by QR codes, linking each component of the skill (technical steps, instructional steps, and common mistakes) to a corresponding video via the QR code .
- Contents of the QR Code-enabled educational booklet:
- An introduction to the designed educational booklet and how to deal with it in the educational process.
- Introduction to football and the basic skills under discussion.
- Each skill is divided into three parts (technical steps, educational steps, and common mistakes), and each of these parts is linked to its own QR code.
- Illustrative pictures for each part of the skill.
- A detailed theoretical explanation of the skills under investigation.

Main Study

1. Pre-measurements

The participants were tested in the pre-measurements from Wednesday to Thursday, 4-5/10/2023, at the Sport Sciences Faculty in Sadat City

2. Main Program

The researchers implemented the educational program using the instructional booklet supported by a QR code for the experimental group. The program consisted of 10 instructional teaching session over 10 weeks, from October 21, 2023, to December 23, 2023, with one teaching session per week. Each teaching session had a duration of 90 minutes. The program was conducted at the college fields to ensure the availability of the sample and the necessary tools, which helped save time and effort during implementation. The following table shows the time distribution of the proposed educational program using the instructional booklet supported by the QR code.

Table 10. Time distribution of the educational program by using QR Code Supported Educational Booklet

Parts of the educational program	Program timeline
Program implementation period	Two and a half months
Number of weeks	(10) week
Number of educational units	(10) Educational unit
Number of teaching units per week	(1) Educational unit
Application time per unit	(90) minute
Application time per week	(90) minute
Total time to implement the program	(900) minute

Table 11. Time distribution for each educational unit

M	Unit parts	The specified time (M)
1	Administrative work (directions-Absence-Group distribution)	5
2	General warm-up	15
4	Reading the theoretical content of the skill	15
5	Practical application of the program	35
6	Skill advancement drills	15
7	Conclusion	5
Total time		**90 minutes**

Table (10) shows that the time structure of the educational program, utilizing the QR code-supported educational booklet, spans 10 weeks, with a total duration of 15 hours, and comprises 10 instructional teaching session.

Table (11) indicates that the allocated time for different parts of the instructional teaching session ranges between 5 to 20 minutes, with a total duration of 60 minutes per teaching session.

It is clear from Table (12) that the total number of teaching session for the program is (10) educational teaching session, starting from Saturday 10/21/2023 and ending on Saturday 12/23/2024, i.e. for a period of two and a half months.

Table 12. Distribution of educational content across the program's total teaching session

M	Unit number	date	Educational content
1	**The first**	10/21/2023	Kicking the ball with the sole of the foot
2	**Second**	10/28/2023	Skill of kicking the ball with the front of the foot
3	**Third**	11/4/2023	Skill of kicking the ball with the outside of the foot
4	**Fourth**	11/11/2023	Skill of kicking the ball with the inside of the foot
5	**Fifth**	11/18/2023	Review of ball kicking skills
6	**Sixth**	11/25/2023	Skill of running with the ball with the inside of the foot
7	**Seventh**	12/2/2023	Skill of running with the ball with the outside of the foot
8	**Eighth**	12/9/2023	Review of the skills of running with the ball
9	**Ninth**	12/16/2023	Throw-in skill
10	**The tenth**	12/23/2023	Review all skills

3. Post measurements

The researchers conducted the post-test measurements (cognitive achievement test and skill tests) on the main research sample on Sunday and Monday, December 10–11, 2023, at the college sports fields, maintaining the same sequence as the pre-test measurements.

Statistical Analysis

The researchers used the SPSS statistical software to process the research data. The following statistical analyses were applied:

- Arithmetic mean
- Standard deviation
- T- test
- Correlation coefficient.
- Coefficient of distortion
- Percentage of improvement rates.

Results and Discussion

It is clear from Table No. (13) There are statistically significant differences between Pre- and Post-test of the experimental group in variables Skill and level of cognitive achievement, For the benefit of dimensional measurement, where that Calculated t-value , greater From the tabular t-value at a significant level of 0.05,Which indicates The superiority of dimensional measurement over spatial measurement Tribal for the experimental groupin Variables Skill and level of cognitive achievement.

The researchers attribute these results to the educational program using the educational booklet supported by the QR code. QR-code At the level of cognitive achievement and some basic skills in football and the level of cognitive achievement due to it containing pictures, videos and files explaining the basic skills in football (under research), which works to excite

and thrill the students and attract their attention to learning, in addition to the possibility of displaying the educational content at any time and in any place and several times according to the students' ability to comprehend, due to the availability of the mobile phone with all students at all times, which made freedom in the educational process within the lecture

Table 13. Significance of differences between the pre-test and post-test of the experimental group in the skill variables and the level of cognitive achievement (n=40)

Variables		Pre-test		Post-test		Diff. between averages	T value	rate of change %
		Average	SD	Average	SD			
Basic skills	Dribbling the ball in a straight path (S) (Sec)	17.405	2.517	12,449	2.796	4.955	17.152	39.81%
	Throw-in (m)	6.073	1.226	10.137	1.321	-4.065	-36.979	66.91%
	kickball to far (m)	17.915	2.665	31,466	3.810	-13,550	-19.736	75.64%
	Shooting accuracy at the goal (Deg)	3.875	0.766	8,013	0.772	-4.138	-66,750	106.8%
Cognitive (Deg)		14,350	3.527	51.225	3.017	-36.875	-49.481	256.96%

* Table (t) value at 0.05 and a degree of freedom (39)= 2.0231

This is consistent with what he indicated Al-Sayeh, M., & Anas, S. (2000) The curricula of physical education and its various activities are dominated by the practical aspect, and therefore educational techniques represented in the various visual and audio means, tools and devices play a general role in highlighting the specific components of movement in addition to the bright and enjoyable aspect of the teaching process, which leads to increasing the attention of learners towards it, and thus acquiring the activities of physical education curricula.

These results are consistent with the results of the study of both Eid, A. (2015), Khairat, M. (2017), Gamal, A. (2018), Mohamed, R. (2020), Gamal, H. (2021) ,On the positive impact of using the QR code-enabled brochure QR-code In improving the level of cognitive achievement and some basic skills in individual and team sports.

This result confirms the validity of the first hypothesis of the research, which states that: There are statistically significant differences between the averages of the pre- and Post-test of the experimental group in the level of cognitive achievement and some basic skills in football for female students, in favor of the post-measurement.".

It is evident from Table No. (14) that there are statistically significant differences between the pre- and post-test results of the control group in the variables of skill and cognitive achievement, with the post-test showing superior performance. The calculated t-value is greater

than the tabulated t-value at a significance level of 0.05, indicating the superiority of the post-test over the pre-test in the control group in terms of skill and cognitive knowledge levels.

Table 14. Significance of differences between the pre-test and post-test of the control group in the skill variables and the level of cognitive achievement (n=40)

Variables		Pre-test of		Post-test of the		Diff.	T value	rate of change
		Mean	SD	Mean	SD			
Basic skills	Dribbling the ball in a straight path (S) (Sec)	17,36	2.511	16.192	2.539	1.170	21,490	7.22%
	Throw-in (m)	6.202	1.324	7,960	1.256	-1.758	-20.184	28.34%
	kickball to far (m)	17.13	3.510	22.983	2.876	-5.856	-10.568	34.19%
	Shooting accuracy at the goal (Deg)	4.063	0.700	6,013	0.888	-1.950	-10.640	47.99%
Cognitive		14.75	3.650	37.100	11,02	-22.350	-12.360	151.52%

*Table (t) value at 0.05 and a degree of freedom (39) = 2.0231

The researchers attribute this progress in the control group to the effectiveness of the traditional teaching method, which plays a significant role and cannot be overlooked. This method involves students receiving information and concepts directly from the teacher, who explains the skill, demonstrates it, and provides gradual feedback at each stage of learning. Additionally, the traditional method fosters social interaction and human relationships among students, along with the ongoing competition between them to perform better. All these factors contribute to enhancing students' motivation to learn, which positively influences the efficiency of skill performance.

The researchers also attribute these differences that occurred in the control group between the pre- and post-measurement in learning basic football skills to the regular attendance of the students in the teaching session in order to learn football skills in addition to the time difference between the two measurements, as during this period of time the learners practiced the practical curriculum for basic football skills (under study) with correction of the errors that appeared in them and guidance for correct performance.

From the above, it becomes clear that the traditional method used (explanation and presentation) has real advantages that have had a positive impact on the level of cognitive achievement and some basic skills in football (under study) These results are consistent with the results of many studies on the impact of the traditional method on the level of skill performance among female students.

This is consistent with the results of the studies of both “Ahmed, R. I. (2020), Mustafa, Y. (2020), & Mohamed, H. (2019). The use of the traditional method (explanation and model) is very effective in learning different motor skills.

This result confirms the validity of the second hypothesis of the research, which states: "*There are statistically significant differences between the pre- and post-test averages of the control group in terms of cognitive achievement and certain basic football skills for female students, with the post-test showing superior results*."

It is clear from Table No. (15) that there are statistically significant differences between the post-test results of the experimental and control research groups, in favor of the experimental group's post-test. The calculated t-value ranged between 7.557 and 11.239, which is larger than the tabulated t-value at a significance level of 0.05. This indicates the superiority of the post-test for the experimental group over the post-test for the control group in terms of skill and cognitive achievement

Table 15. Significance of the Differences Between the Post-Test Measurements of the Experimental and Control Groups in Skill Variables and Cognitive Achievement Level (n1=n2=40)

Variables		Post-test experimental group		Post-test control group		Diff. between averages	T value	rate of change
		Average	SD	Average	SD			
Basic skills	Dribbling the ball in a straight path (S) (Sec)	12,449	2.796	16.192	2.539	-3.742	-6.267	30.06%
	Throw-in (m)	10.137	1.321	7,960	1.256	2.178	7.557	27.34%
	kickball to far (m)	31,466	3.810	22.983	2.876	8,483	11,239	36.90%
	Shooting accuracy at the goal (Deg)	8,013	0.772	6,013	0.888	2,000	10.751	33.26%
Cognitive (Deg)		51.225	3.017	37.100	11,02	14.125	7.821	38.07%

The researchers attribute the superiority of the experimental group over the control group in terms of skill performance and cognitive achievement in some football skills (under study) to the positive impact of the educational program based on the use of the educational

booklet supported by the QR code. QR-code is one of the modern teaching methods and the preparation and good technical design of the football booklet supported by the QR code that was designed in accordance with the requirements of smart phones. The QR-code feature also allowed learners the freedom to choose the appropriate navigation methods and thus allowed learners to control the learning process. Interactive multimedia (text, images, video) was also prepared, in addition to the educational content being distinguished by simplicity and its logical sequence and getting out of the restrictions of the printed material, which positively affects the technical aspect of performing the basic skills under study.

This is consistent with what was indicated by both Saad, M., Helmy, M., & Saeed, H. (2001) that it is not possible to teach sports activities skills through indoctrination and memorization because they are in dire need of exploiting all means of scientific and technological progress in terms of methods and techniques in order to facilitate for the teacher and the learner to reach the desired goals.(Saad, M., Helmy, M., & Saeed, H.,2001)

Abdel Hamid, J. (2005) also points out that following the traditional method in teaching does not guarantee success in teaching skills that require long training and more time because the teacher in this method, no matter how efficient he is in teaching, does not guarantee success in completing the learning process. He is satisfied with giving the model and does not specify educational means in the lesson, In doing so, he attracts the learner's attention and does not push him to think and discover, This contradicts modern concepts of education, which called for each learner to have his own personality that must be respected and worked on to correct it, and to provide the opportunity for the educational situation through which his personality can be highlighted.(Hamid, J. A.,2005)

The researchers also attribute these differences and the percentages of improvement that occurred in favor of the post-measurement of the experimental group to the use of the booklet supported by the QR code in the educational process, which helped to involve the students in more than one sense, which has an impact on the process of remembering during performance, i.e. it helps to maintain the effect of learning the method of performance and the information associated with the skill, which led to increased motivation and more effort among the members of the experimental group to learn and form an integrated and comprehensive cognitive background, and this had a positive impact on skill performance, which indicates that the educational program using the booklet supported by the QR code has a positive impact on improving the level of cognitive achievement and raising the level of performance of basic skills among the students of the research sample.

And it is agreedThis is consistent with the results of both Chi et al. (2009) , Eid, A. (2015), Khairat, M. (2017), Al-Sayed, A. (2018), Muhammad, R. (2020), Ahmed, S. (2020), & Jamal, H. (2021). ,The use of the booklet supported by the QR code has a positive impact on the development and improvement of the level of skill performance among the members of the experimental group under study compared to the traditional method.

This result confirms the validity of the third hypothesis of the research, which states that: ‘ *’There are statistically significant differences between the averages of the two Post-test of the two groups (experimental - control) in the level of cognitive achievement and some basic skills in football for female students, in favor of the post-measurement of the experimental group.*"

Conclusion

Considering the research objective, its hypotheses, the methodology used, and within the limits of the research sample, and based on the statistical processing of the data and the results it indicated, the following can be concluded:

Tutorial using a tutorial booklet supported by quick response code (QR-code) has a positive impact on improving the level of cognitive achievement and the level of some basic skills in football under study for the experimental group.

The method based on verbal explanation and practical model performance has a positive effect on improving the level of cognitive achievement and the level of some basic skills in football under study for the control group.

The tutorial using a QR code-supported educational booklet has the greatest impact on improving cognitive achievement and the development of certain basic football skills. The method being investigated is based on verbal explanations and the performance of practical models, which demonstrates the effectiveness of using the QR code-supported educational booklet in the learning process.

Recommendations

Based on the results reached by the researchers through this research, the researchers recommend the following:

- Utilizing the educational program through the QR code-supported booklet to enhance cognitive achievement and learning of basic football skills among female students at the College of Physical Education
- Employing this program to present and explain various motor skills, aiming to avoid the drawbacks of the traditional method of skill explanation and demonstration
- Integrating educational technology, particularly the QR code-enabled educational booklet, into university education programs
- Exploring the application of learning through the QR code-supported educational booklet in various sports and games
- Conducting similar studies and research using the QR code-supported educational booklet across different age groups

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