Research Paper

The Effect of an Educational Program Based on Education Automation in Improving Some Complex Skills in Futsal for Young Women Aged 14-16 Years

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ABSTRACT

The importance of the research lies in developing new educational programs that rely primarily on modern educational technologies and a serious attempt to develop a more modern approach to motor learning. The research problem was evident in the need to study the impact of an educational program based on automated learning on improving some complex skills in futsal among young women. Does this program contribute significantly to improving motor performance compared to traditional educational methods? How can automated learning contribute to accelerating motor skill learning in this age group? The research aimed to identify the impact of an educational program based on automated learning on learning some complex skills in futsal among young women aged 14-16 years. The researcher hypothesized that the educational program based on automated learning would have a clear impact on improving some complex skills in futsal among young women aged 14-16 years. The researcher deliberately defined the research community as female secondary school students, and the research sample was limited to a group of 33 female students aged 14-16 years. In light of the findings, the researcher concluded that the educational program based on automated learning demonstrated clear superiority when used during the educational units of the curriculum. Accordingly, the researcher recommended the use of the educational program based on automated learning to improve the complex skills of futsal among young women aged 14-16 years.

1. INTRODUCTION

Futsal is a sport that requires fine motor skills, which are essential for improving players' overall performance and ensuring superiority in matches. With the advancement of technology, new training methods have emerged that contribute to enhancing motor performance efficiency. One such method is automated learning, which relies on the use of modern technologies to deliver interactive and effective educational programs. An automated learning program is one of how female futsal players can improve their performance, as it provides a guided learning environment that contributes to learning motor

skills faster and more accurately. By using this method, players are able to learn more interactively, which contributes significantly to improving their motor performance and increasing their playing efficiency. Improving motor performance requires a focus on innovative training techniques that contribute to developing basic skills quickly and effectively. By adopting educational automation, players can benefit from a more interactive and precise learning environment, which contributes to motivating them to learn motor skills more efficiently.[1] Hence, the importance of research into developing new educational programs that rely primarily on modern educational technologies and a serious effort to develop a more modern approach to motor learning.

Research Problem

Futsal skills are among the basic motor skills that players need to continuously develop to improve their performance in matches and sports competitions. However, training these skills in early age groups, such as junior girls between 14 and 16 years old, faces some challenges, including poor execution accuracy and rapid response in various motor situations.

Traditional teaching methods may not provide sufficient interaction or immediate feedback to help players correct their mistakes and achieve rapid improvement in their performance. In this context, the importance of employing modern technologies such as learning automation, which relies on instant interaction technology and rapid feedback to improve motor performance, is highlighted. Accordingly, the research problem stems from the need to study the effect of an educational program based on learning automation on improving some complex skills in futsal for junior girls. Does this program contribute to significantly improving motor performance compared to traditional teaching methods? And how can learning automation contribute to accelerating the learning of motor skills in this age group?

2. RESEARCH OBJECTIVES

1. To identify the effect of an educational program based on automated learning on learning some complex skills in futsal among young women aged 14-16.
2. To identify the differences between the experimental group undergoing the automated learning program and the control group following the traditional method in the post-tests.

Research hypotheses

1. The automated learning program had a clear effect on improving some complex skills in futsal among young women aged 14-16.
2. There was a statistically significant difference in the post-tests between the experimental group undergoing the automated learning program and the control group following the traditional method.

Research Areas

Human Area: Female students aged 14-16 from Kirkuk, secondary school students for the 2023-2024 academic year.
Spatial Area: Sports Hall, Kirkuk.
Time Area: November 1, 2023 to January 31, 2024.

3. RESEARCH METHODOLOGY

The researcher used the experimental method due to its suitability to the nature and objectives of the research.

Experimental Design

The researcher used an equivalent groups design (a pre-post measurement design for both the experimental and control groups, in which the first group is exposed to the independent variable, while the second group is not exposed to the independent variable) .[2]
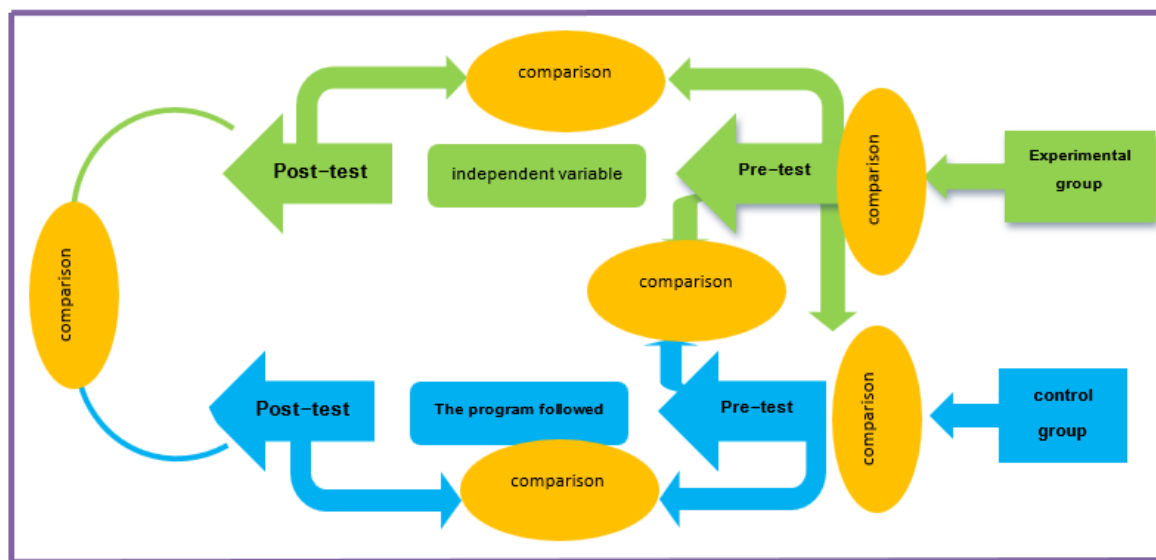

Figure 1: Shows the experimental design

Research Community and Sample

The researcher intentionally defined the research community as female high school students. The research sample was limited to a group of 33 female students aged 14-16 years. Three students were excluded because they did not adhere to attendance and the curriculum. Five students were excluded due to their families' refusal. Five students were excluded after conducting a matching process and exploratory experiments, leaving 20 of the sample. The sample percentage for the community was 60.60%.

Research Tools: The researcher utilized the following research tools:

- Arabic and foreign sources.
- Observation and experimentation.
- Tests and measurements.

Devices and Tools Used: The researcher used the following devices and tools:

- A closed indoor soccer hall.
- (20) legal indoor soccer balls

- A measuring tape.
- Adhesive tape.
- A whistle.
- A handheld scientific calculator.
- A medical scale for measuring mass.
- A metric tape measure for measuring lengths.
- A laptop calculator.
- A digital camera.
- A mobile phone camera for taking pictures.
- One (100)-size display screen.
- A DJ speaker.
- Paper and pens.

Field Research Procedures

Homogeneity and Equivalence

1. Homogeneity of the Research Sample

The researcher conducted homogeneity testing for the research sample members across all variables that might affect the research results, as shown in Table 1.

Table 1. Shows the homogeneity of the sample

Variables	Mean	Median	Std	Skewness	Indication
Length	156.25	156	3.15	0.39	Homogeneous
Mass	53.4	52.5	2.89	0.33	Homogeneous
Chronological Age	15.25	15	0.85	-0.37	Homogeneous

2. Equivalence of the two research groups

To verify the equivalence of the experimental and control groups for the research sample, an equivalence test was conducted in the skills (receiving, then passing, receiving and rolling, then passing, receiving, then scoring, receiving and rolling, then

scoring) to determine the skill performance level of the two research groups. The equivalence test was conducted on November 8, 2023, corresponding to Wednesday, at exactly 9:00 AM, inside the closed sports hall in Kirkuk, as shown in Table 2).

Table 2. Shows the means, standard deviations, calculated t-value, and probability level (receiving, then passing, receiving and rolling, then passing, receiving and rolling, then scoring, receiving and rolling, then scoring) in the equivalence test

Variables	Units	Experimental Group		Control group		(t) value	Sig Probability Level
		Mean	Std	Mean	Std		
Receive, then pass	Degree	0.059	0.042	0.078	0.033	-1.107	0.283
Receive, roll, then pass	Degree	0.066	0.035	0.090	0.019	-1.934	0.73
Receive and score	Degree	0.093	0.119	0.037	0.030	1.435	0.168
Receive, roll, then score	Degree	0.043	0.032	0.041	0.032	0.184	0.856

Tests and Measures[3]

1. (Receive and Pass) Test.
2. (Receive, Roll, Pass) Test.
3. (Receive and Score) Test.
4. (Receive, Roll, Score) Test.

Pilot Experiment

This experiment was conducted on Sunday, November 5, 2023, on a sample of 5 female students, who were randomly selected and subsequently excluded from the main experiment. The objectives of the pilot experiment were as follows:

- To identify any errors and obstacles that may occur and attempt to develop solutions before beginning the implementation of the educational program.
- To verify the suitability of the location for implementing the educational program.

- To verify the suitability of the educational program and its implementation method for the level of the research sample.
- To determine the best method for obtaining accurate results when implementing the educational program.

Main Experiment

1. Pretests

Since the equivalence tests for the complex skills (receiving, then passing, receiving and rolling then passing, receiving then scoring, receiving and rolling then scoring) are the same as the pretests, the results of the equivalence tests were used as the pretest results.

2. Educational Program

The researcher designed an educational program. He enlisted the help of a computer engineer to organize and automate the

program using visual devices (display screens) and audio devices (DJs). The educational material was programmed and linked to technology, resulting in an automated educational program. Learning is self-directed for the research sample, not by the subject teacher or the test taker, but rather based on what the program dictates to them through the display screen displayed on the sample, according to the following steps:[4]

- The closed room is equipped with a display screen and the required equipment, according to the objectives of the educational unit.
- Students in the experimental group enter the closed hall, and their assigned tasks are explained to them in advance during an introductory lecture.
- Upon hearing the start signal and the word "Start" appears on the screen, they begin implementing the educational unit according to the correct sequence (introductory part - main part - concluding part) .
- The assigned tasks are explained to the research sample members via the display screen, as detailed in the educational unit model. This way, the students rely 100% on the display screen, with no one to guide them.

The main part of the educational unit includes a number of skill exercises, utilizing the main section of the educational unit. This was prepared based on an analysis of scientific sources. The educational program was implemented after the experimental group was identified, and the exercise steps and how to perform them were explained via the programmed display screen.

Educational Program Timeline:
The educational program for the experimental group (the educational program based on automated learning to improve some complex skills in futsal) included (12) educational units for the experimental group, distributed over (6) weeks, with two educational units per week. Each educational unit lasted (45) minutes. The control group received the curriculum prepared by the subject teacher for the same duration as the educational unit, ensuring equal number of units for the experimental and control groups, starting from November 29, 2023, until January 3, 2024.

3. Post-tests:
After completing the educational program, the post-test was conducted for the two research groups (experimental and control) on November 17, 2024, taking into account the time and space conditions and methods of the pre-test, with the assistance of the support team.

Statistical Methods
Data were processed using the statistical package (SPSS).

RESULTS AND DISCUSSIONS
Presentation, Analysis, and Discussion of Results:
1. Presentation, Analysis, and Discussion of the Results of the Tests (Pre- and Post-Tests) for the Experimental Group

Table 3: Shows the statistical values (mean, standard deviation, calculated t-value, and significance level) for the skills (receiving then passing, receiving and rolling then passing, receiving then scoring, receiving and rolling then scoring) in the pre- and post-tests for the experimental group

Variables	Units	Pretest		Posttest		(t) value	Sig Probability Level
		Mean	Std	Mean	Std		
Receive, then pass	Degree	0.059	0.042	0.378	0.062	-11.487	**0.000**
Receive, roll, then pass	Degree	0.066	0.035	0.357	0.064	-10.697	**0.000**
Receive and score	Degree	0.093	0.119	0.460	0.060	-8.755	**0.000**
Receive, roll, then score	Degree	0.043	0.032	0.375	0.093	-8.444	**0.000**

It is evident from Table 3) when processing the values of the means and standard deviations between the pre- and post-tests of the experimental group that the test results were in favor of the post-test for the value of (T) at the error level, which was ≤ (0.005). The researcher attributes the significant difference to the result of the educational program prepared according to the automation of education, which had a significant impact in improving some of the complex skills of futsal among young girls aged 14-16 years. The automation of education included the use of visual devices (display screens) and audio devices (DJs), and the educational material was programmed and linked to technologies, resulting in an automated educational program that is self-learning for the research sample members, not by the subject teacher or the person conducting the test, but rather by

relying on what the program dictates to them through the display screen that appears to the sample members.[5] This is what was concluded from the results of the post-tests, which showed clear superiority and improvement in some of the complex skills of futsal for the study sample (young girls aged 14-16 years). This was confirmed by (Al-Salmi) "that the automation process addresses all tasks and activities of the educational institution, relying on all necessary information technologies to achieve the management's goals of simplifying procedures and completing all tasks quickly and accurately. This is what the first hypothesis of the study achieved, which stipulates that the educational program according to the automation of education has a clear impact on improving some of the complex skills in futsal among young girls aged 14-16 years.[6]

Table 4: Shows the statistical values (mean, standard deviation, calculated t-value, significance level for the skills (receiving then passing, receiving and rolling then passing, receiving then scoring, receiving and rolling then scoring) in the pre- and post-tests for the control group

Variables	Units	Pretest		Posttest		(t) value	Sig Probability Level
		Mean	Std	Mean	Std		
Receive, then pass	Degree	0.078	0.033	0.191	0.055	-5.115	0.001
Receive, roll, then pass	Degree	0.090	0.019	0.154	0.039	-4.478	0.002
Receive and score	Degree	0.037	0.030	0.230	0.044	-14.187	0.000
Receive, roll, then score	Degree	0.041	0.032	0.155	0.047	-6.674	0.000

Table (4) shows, when processing the means and standard deviations between the pre- and post-tests for the control group, that the test results favored the post-test, with the (t) value at the error level of ≤ 0.005. The researcher attributes the significant difference to the control group achieving a certain level of learning as a result of the method and approach followed by the teacher, such as increasing the number of repetitions of the exercises used in the educational units, as well as segmenting and simplifying the skill and using the principle of gradual and repetitive skill performance. This resulted in a noticeable improvement in the level of learning of complex skills. "Each motor skill requires the organization and arrangement of specific muscle groups in a specific direction, which will improve the performance of that skill".[7] Furthermore, the experimental group sample enjoyed a drive to successfully practice sports, which led to an improvement in their post-tests. "Each age group is characterized by the natural development of certain abilities, and these abilities can also be developed through training and practice." .[8]

Table 5. Shows the statistical values (mean, standard deviation, calculated t-value, and significance level for the skills (receiving then passing, receiving and rolling then passing, receiving then scoring, receiving and rolling then scoring) in the post-post tests for the experimental and control groups

Variables	Units	Posttest experimental		Posttest control		(t) value	Sig Probability Level
		Mean	Std	Mean	Std		
Receive, then pass	Degree	0.378	0.062	0.191	0.055	7.120	0.000
Receive, roll, then pass	Degree	0.357	0.064	0.154	0.039	8.491	0.000
Receive and score	Degree	0.460	0.060	0.230	0.044	9.657	0.000
Receive, roll, then score	Degree	0.375	0.093	0.155	0.047	6.598	0.000

Table (5) shows, when processing the means and standard deviations between the post-tests for the experimental group and the control group, that the test results favored the post-test for the experimental group, with a t-value at the error level of ≤ 0.005.
The researcher attributes the significant difference between the experimental group and the experimental group to:
1- The effectiveness of the educational program based on educational automation, which emphasizes comprehensive education and the use of multiple media to ensure organized and interconnected steps in the process of quality education, thus achieving educational goals. "Educational automation leads to increased effectiveness of cooperation between different work teams, which supports the educational process and contributes to raising its efficiency." [9] Al-Turki adds that one of the most important goals of educational automation is to encourage students to love knowledge, expand the scope of the educational process, and develop their creative thinking.[10]
2- The effectiveness of the educational units, which included specific exercises with multiple repetitions, significantly contributed to improving the complex skills of futsal for the experimental group sample more than the control group sample. "The careful selection of exercises, their repetition, and the arrangement of tools and devices within the educational units contributed to organizing and linking the educational experiences of the learners" .[11] This is what achieved the second hypothesis, which states: "There is a statistically significant difference in the post-tests between the experimental group that is subject to the educational program according to the automation of education and the control group that follows the traditional method in the post-tests."[12]

CONCLUSIONS
1. The experimental study sample demonstrated superiority and clear improvement in the post-tests of the educational program based on automated learning in improving some complex skills in futsal among young women aged 14-16 years.
2. The control study sample demonstrated a significant improvement in the post-tests, but to a lesser extent than the experimental study sample, in the educational program based on automated learning in improving some complex skills in futsal among young women aged 14-16 years.
3. The educational program based on automated learning demonstrated clear superiority when used during the educational units of the curriculum.

RECOMMENDATIONS
1. Emphasize the use of the educational program based on automated learning to improve complex skills in futsal among young women aged 14-16 years.
2. Emphasize that the researchers conduct a new study based on automated learning to develop and improve various sports skills.

3. The need to pay significant attention to educational programs in line with the automation of education in schools.

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