

The Impact Of Various Introductory Exercises Accompanied By Real-Time Feedback On The Fifth-Grade Pupils To Perform The Backhand Stroke In Badminton

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Abstract

The study aimed to measure the effect of various introductory exercises accompanied by instantaneous feedback on pupils' performance of the backhand skill of hitting the dimensions in the badminton game. It also explored the difference between the experimental and control groups performance in the post-test due to the effect of the experiment. To achieve such goal, an experimental design was used with two groups appeared in pre and post-tests. The study assigned purposefully 16 fifth-grade female pupils as the sample (6 control and 6 as experimental) of the study. The researchers used the pre and post-test to collect data from the sample. Results showed that the various introductory exercises accompanied by real-time feedback were highly effective in developing and improving the pupils' performance to hit the backhand badminton. Likely, the findings revealed that a statistically significant difference was assigned in learning the performance of stroking the back dimension of the badminton between the pre and post-tests in favor of the post test of the experimental group. Furthermore, the experimental group outperformed the control groups significantly. The study indicates teachers to apply such introductory exercises to develop their pupils' kinetic skills.

Keywords: Introductory exercises, real-time feedback, backhand, badminton.

I- Introduction

Due to the recent scientific development as well as the global revolution in all various fields generally and at the Colleges of education particularly, recent studies have proven that effective education occurs at the early age of learners because of its distinguished position among those interested scholars in most countries of the world. Such interest is one of the most important standards by which the progress and civilization of countries are measured including their advancement, attention to the talents of their children, and their assistance in the proper motor development of any event.

The introductory exercises are considered as one of the ways of teaching various sports games and activities. Students through such exercises can

acquire motor skills faster and more interestingly. These exercises are suitable for different age groups and both males and females, taking into account that the different growth characteristics of each age stage should agree in terms of ease and complexity. Practicing these exercises is one of the important means that contribute to learning motor skills in sport games and events, and among these games is the game of badminton. The badminton game is one of the individual games that has witnessed a great development recently due to its entry into the Olympics. Therefore, competitions among countries have increased in devising the best educational techniques to help develop the performance of their players. The development of skills in the badminton game is characterized by a high level

of difficulty due to the speed of the shuttlecock and the multiplicity of its kinetic paths at one point, and this requires the player to possess high physical, skill and kinetic qualities in addition to a high ability to find appropriate ways for the obstacles he faces during the match

2-1 Significant of the study

The importance of the research is manifested in the interest in using a variety of introductory exercises in learning the skillful performance of some basic skills in badminton is essential to understanding the learning of the pupils. So many developed countries pay special attention to this early stage and see the need of the learners and accordingly educational programs for this important stage will be developed. This crucial period of an individual's life is characterized with general specifications that distinguish it from other periods in human life. It is the period during which the pupils' senses are sharpened, which are considered as doors and an entrance to mental knowledge.

2-2 Research Problem

As a result of the researchers' interest in the badminton game and after studying the techniques and methods to learn badminton skills, they noticed that there is a paucity of use of modern methods in exercises that help to learn skills for beginners in the early stages and that beginners make many mistakes in performance, and that the use of introductory exercises may help the novice in learning the easiest The skill and its mastery are better, especially if it is accompanied by feedback during performance to correct errors and enhance the level. Therefore, the researchers decided to study this problem and develop some solutions through the following question:

- Do introductory exercises accompanied by real-time feedback help in learning the skill of stroke the backhand in badminton?

2-3 Research Objectives

1- Preparing a variety of introductory exercises accompanied with real-time feedback in learning the performance of hitting the backhand dimensions in badminton.

2- Recognizing the effect of various introductory exercises accompanied by real-time feedback on learning the performance of hitting the back dimensions in badminton.

2-4 Research Hypotheses

1. There is a statistically significant relationship in learning the performance of the back dimension stroke in badminton between the pre and post-tests.
2. There is a statistically significant relationship in learning the performance of the back dimension stroke in badminton between the experimental and control groups

3- Methods

3-1 Research Design

The researchers applied the two-group experimental design for its suitability in solving the research problem and achieving the research objectives.

3-2 Participants

The research assigned 16 female pupils from the total (200) of pupils studying at Fink Private School, Irbid, Iraq. The sample was chosen in a deliberate way from the pupils of the fifth grade of primary school. Moreover, (4) pupils were chosen randomly to represent the exploratory experiment. The sample of (12) pupils was randomly divided into two groups by lottery method, the first group (experimental) and the second group (control) with (6) students for each group. Table (1) shows the sample distribution.

This school was chosen for the following reasons:

- 1- Availability of a suitable room for practical application.
- 2- Availability of the necessary tools to perform the physical education lesson.
- 3- Availability of the research sample.

Table 1. research population and sample.

No	Population	Exploratory Sample	Participants	Number	Procedures
1	200	4	Experience group	6	Various introductory exercises
2			Control group	6	Traditional School style

3-3 Experimental Design

The researchers relied on the experimental design of equal groups with pre- and post-tests” (Abbas et al., 2012). Figure (1) illustrates the obtained design.



Figure 1. The experimental design for the two groups

3-4 Scientific Basis for the Tests

The researchers conducted tests on the sample extract from the research community, which numbered (4) players, the exploratory experiment sample, after which the validity and reliability of the tests were measured.

3-4-1 Validity

The researchers obtained face validity by sending the tests to a group of experts and specialists. In order to ensure the validity of the tests, the self-validity was found, which is the square root of the reliability, as it gained high self-validity.

3-4-2 Reliability

In order to obtain the reliability of the tests, the researchers applied the test-retests to the exploratory sample of (4) players on (15/11/2021). They were extracted from the research community and the test was re-applied to the same sample on (22/11/2021) under the same circumstances in which they were made. The researchers used this method (test-retest) because it is one of the best and most common methods in calculating the reliability of the test. Therefore, the correlation coefficient (Pearson) was found between the first and second tests, researchers to obtained the stability of the tests.

Table (2). The scientific basis of the test

Test	group	Means score	Standard deviations	Correlation coefficient	Test-retest reliability
backhand	First test	2,575	0,175	0,983	0.983
	Second test	2,525	0,205		

* Significant if the P value is less than or equal to (0.05)

3-5 The Homogeneity of the Sample:

The researchers performed homogeneity among the research sample for the variables (age, height, weight) in order to ensure that all the players fall within the normal distribution by calculating the Skewness coefficient, which falls within (± 1).

Table 3 shows the homogeneity procedures for the research sample.

According to Table 3, it can be seen that the skewness coefficient values range between (+1 and -1) and this indicates the normal distribution of the sample, that is, it is homogeneous in the variables (age, height and weight).

Table 3. The homogeneity of the sample

Statistics variables	Measurement unit	Mean scores	Standard deviations	Median	Skewness coefficient
age	Year	11,916	0,668	12,000	0,086
height	Centimeter	143,583	2,429	143,000	0,312
weight	Kilogram	43,416	2,193	42,500	0,848

3. 6. Means, devices and tools used:

3-6-1 Data collection instruments:

- Arab and foreign sources.
- The Internet.
- Performance evaluation questionnaire form.
- Tests and Measurement

3-6-2 Tools and devices used in the study

- An equipped and planned badminton court.
- Laptop calculator (Hp) type.
- Camera and accessories (Sony) type.
- 12 feather bats.
- Unix feather, 12 packs.
- Medical scale.
- Length measuring tape.
- Adhesive tape.
- Feather net.

3-7- Research Variables

One of the characteristics of experimental design is that the researchers deliberately treat certain factors under precisely controlled conditions in order to verify how a situation or accident occurred and determine the causes of its occurrence (Van Dalen, 1984).

3-7-1 Independent Variables

The independent variable is the variable that affects the dependent variable and is not affected by it (Alyan, 2008). It represents the independent variable in the current research - introductory exercises accompanied by instantaneous feedback.

3.7.2. Dependent Variables

The dependent variable is the variable that is changed and is affected as result of the independent variable effect (Owais, 1999). It is the backhand of the badminton in this study.

3.7-3 Extraneous Variables

It is generally agreed that the success of the experimental design has two aspects, one internal related to the validity of the experimental treatment and the other external related to the generalizability of the results (Mustafa, 2009). Among the most important variables that threaten the internal and external safety of research are: First: the internal integrity of the design: The most important variables that affect the dependent variable are:

Conditions of the Experiment

With regard to the implementation of the experiment, the researchers did not expose to any accident that affected the experiment throughout the duration of the experiment.

Maturity related processes:

It means all the variables related to the biological and psychological growth that the sample members are exposed to in this period, which affect their responses (Odeh & Malkawi, 1987), and since all the pupils of the two groups (experimental and control) were homogeneous in their chronological age, that is, they are exposed to the same growth processes and this in turn reduces the effect of the extraneous variable on the dependent variable.

Second: External Safety

The safety of the design is achieved when the researcher is able to generalize the results of his research outside the scope of the research sample and in similar experimental situations (Katheer, 2007). In order to ensure the external integrity of the design, the research experiment should be free from the following errors:

-Overlapping experimental situations

The members of the research sample were not exposed to other experiment during the time period for implementing the research experiment.

-Teaching materials

The researchers prepared the curriculum for the experimental group, and it was exhibited to a number of specialists in order to support the correct scientific method, indicate the validity of this educational program and make scientific observations about it.

-The teacher

The female teacher (Russell Muhammad is Bachelor's graduate, physical education teacher at Fink National School/ Erbil), taught the two research groups after informing her about the educational curriculum of the experimental group (introductory exercises) and making observations by the researchers. Thus, isolating the education factor as an influential factor in the results.

- Duration of treatment

This variable was controlled by subjecting the two research groups to one study period of (16) educational units, and one time period of learning (45) minutes per educational unit, as the duration

of the experiment lasted (8) weeks, with two educational units per week for each group.

- The place of performing the treatment

The educational units were implemented in one place, which is the hall of the Fink Private School in Erbil, in succession, which helped to overcome the differences that arise in terms of location and lighting that affect the course of the experiment.

-Experts:

The experts carried out the evaluation process for the performance of the pupils in the pre and post-tests.

3.8. The Educational Program

The researchers presented a proposed educational program to experts and specialists, and their opinions and suggestions were taken into consideration to prepare the final version of the educational program and its applicability to the experimental group. It practically included the effect of a various introductory exercises accompanied by real-time feedback on learning the performance of the backhand skill in badminton. The implementation of the educational program relied on the followings:

3-8-1 Time Plan for the Educational Program:

- ❖ The duration of the educational program is (16) educational units.
- ❖ The implementation of the educational program took (8) weeks at a rate of (2) educational units per week.
- ❖ The exercises in the educational units were sequenced according to their order in learning the technical performance of the backhand skill.

3.8.2 Sections and Content of the Educational Units:

After reviewing the scientific sources and some previous studies, the sections and contents of the

educational units were prepared and presented to specialists in the field of sports to provide their opinion on the validity and which modifications they deem were appropriate. Experts were also request to detect the exploratory experiments that researchers determined for the time to achieve in the educational unit, especially the applied section in terms of time, repetition and comfort between the exercise and the total break between exercises shown in Tables 5 and 6. The educational unit was divided as follows:

First, The Preparatory Section:

The total time took (10) minutes, and its goal was to warm up in a general way for all parts of the body to serve the main section of the educational unit, as well as to give physical exercises according to the type and importance of the skill given.

Second: The Main Section:

The total time estimated for the educational and applied section took (30) minutes, where the female teacher explained and applied the introductory exercises, especially for the pupils of the fifth grade of primary school, in an overlapping manner, because the majority of the introductory exercises depend on immediate feedback on performance. Likely, this is done on all educational units for the experimental group, whereas the control group did not perform such exercises, but depended on the traditional exercises within the curriculum followed by the school, which include learning the stroke of the back dimensions with badminton.

The total unit time is (45) minutes, as the female teacher implements the educational unit by explaining the movements, then displaying them and applying them and the players practice them.

Third: The Closing Section:

The total time took (5) minutes, and included calming and relaxation exercises.

Table 5. Duration of the educational program

Total unit	Total time in minutes	Weekly time in minutes	Teaching time for a unit	Number o weeks
16	360	90	45	8

Table 6. Sections and content of the educational unit and the time for each

Educational unit sections		Time	activities
Preparatory		10	Managerial activity special warm-up
Main section	The educational and practical section	30	A simplified explanation of the concept to be learned
			Applying the concept through the implementation of educational assignments
Closing		5	relaxation exercises.

3-9 Evaluation of Technical Performance:

The researchers relied on the apparent shape of movement in evaluating the technical performance of the skill or the movement, because the motor skills in question lead once and their duty ends, so the researchers prepared a questionnaire form to determine the degrees of the sections of the virtual motor construction of the technical performance of the backhand skill. Besides, it was presented to a group of specialists in the sports field in order to determine the degrees of the sections of the virtual construction that includes (the preparatory section, the main section, the closing section) provided that the total score is from (10 scores), and the sports skills or movements performed by the students can be evaluated in one of the following ways (Mahjoub, 1987):

The first method: Performing the movement and evaluating it by experts or by an expert watching and recording the movement.

The second method: Performing the movement and evaluating it after recording it pictorially by means of a cinematic or video (film) and then displaying it by well-known projectors and analyzing it by experts and specialists.

The researchers used the second method mentioned above to evaluate the apparent shape of the movements under study, where the researchers used video imaging and prepared it on a compact disc (CD) to evaluate the technical performance of the sample by three assessors. They are experienced and specialized in badminton. In addition to that, the evaluation process was conducted by the same assessors. They accepted to evaluate the technical performance in the pre-tests, and each of them

used a special form in which points are deducted from the movement according to the occurrence of the error and for each part of the player's body. Each of the players was evaluated by giving a score of the total score of (10), and then extracting the mean score for each player to be the player's performance of the skill or movement, and the researchers used a special form to recording the data.

3-10 Administrative and Organizational Procedures:

3-10-1 Administrative Procedures:

In order to facilitate the research procedures and facilitate the researchers' task, the concerned authorities were approached to obtain consent approvals to conduct the research.

3-10-2 Organizational Procedures:

The researchers gave an introductory lecture to the subject teacher, the assistant work team and the pupils, on how the educational units work. They explained the techniques used in learning and performing the movements under study by stating the objectives of the educational units and all their contents, explaining how to implement the introductory exercises to teach pupils the performance of the back-dimensional stroke in badminton. They also demonstrated to the subject teacher the nature of the research and the experiment that the researchers will conduct. In addition to the commitment to apply the educational units and avoiding missing any knowledge of the effectiveness of the educational exercises. Finally, the researchers emphasized on the performance and implementation of all the duties assigned to pupils during the educational unit.

3-11 Exploratory Experiments:

3-11-1 The First Exploratory Experiment:

The researchers applied the exploratory experiment on Monday, November 15, 2021, on 4 female pupils from outside the research sample in order to reach accurate results before implementing the educational program. The exploratory experiment is considered as a practical training for the researchers to find out the negative and positive issues that they face and to avoid the negative ones during the experiment (Al-Mandalawi, 1989). As soon as the required adjustments were made, the subject teacher, under the supervision of the researchers, conducted the first exploratory experiment. The exploratory experiment aims to (detect):

- 1- The validity of the educational curriculum for application in the final form.
- 2- The appropriateness of the time of the educational units for the research sample.
- 3- The possibility of the teacher to apply the introductory exercises.
- 4- The validity of the devices and tools used.
- 5- The streamline the work and the organization of the pupils in the hall.
- 6- Providing safety conditions to safeguard of the pupils.
- 7- Ensuring the ease of performing the exercises within the prescribed time.
- 8- The ability of the sample to apply the introductory exercises.
- 9- Identifying the obstacles that the teacher and pupils encounter in order to avoid mistakes.
- 10- determining the ability of the assistant work team to carry out their tasks accurately.
- 11- Determining the performance time and repetitions for each exercise.
- 12- Creating a clear picture of the nature of work and how to implement it.

3-11-2 The Second Exploratory Experiment:

The researchers conducted the exploratory experiment on 22/11/2021 on 4 female participants of the research community, and they were excluded from the main experiment after the completion of the second exploratory experiment. The purpose of the second exploratory experiment was:

- 1- Adjusting the factors affecting the process of the photographing movements, through:

- a) Verifying the location of the photographing, and the validity of the camera used.
- b) The height of the camera.
- c) The photographing angle for shooting for the purpose of the clarity of the body during the skill performance.

3-12 Research Procedures:

3-12-1 Pre- tests:

The pre-tests were conducted on the research sample on Wednesday 1/12/2021 at exactly 9 o'clock in the hall of the Fink Private School in Erbil. As the pretests were conducted (taking video of the technical performance of the movements); the researchers tried as much as possible to fix the conditions related to the tests in terms of place, time, tools used, the method of implementation and the assistant work team, in order to provide the same conditions when conducting the post tests. Likely, the trainer and with the help of the assistant work team explained and presented these movements before starting the implementation of the pre-tests in order to shape a clear picture of each movement in front of the sample.

In kinetic learning research, the performance is usually measured prior to the initiation of the experiment, and the purpose is to determine the degree of initiation for the initial performance measurement.

3-12-2 The Main Research Experience:

The curriculum of the introductory exercises accompanied by immediate feedback was implemented on Monday 6/12/2021. The control group learn the skills without using the introductory exercises, while the experimental group learned the skill by using the preliminary exercises accompanied by the immediate feedback.

3-12-3 Post-tests:

The post tests were applied on the research sample after the completion of the educational program, which began on 6/12/2021 and ended on 6/2/2022. At exactly nine o'clock in the morning in the Fink National Hall / Civil/Erbil, using an imaging device. Hence, the performance of the stroke in the back dimensions of the experimental and control groups was photographed, and under the same conditions, the pre-tests were conducted in terms of place,

devices, tools, method of implementation and work.

3-13 Statistical means:

The social statistical package program (SPSS) version (24) was used to process the data for the research, which included the following statistical means:

- Mean scores.
- Simple correlation coefficient (Pearson).
- Median.
- Coefficient of skewness.
- Standard deviation.
- T-test for independent and dependent samples.

4- Results and Discussion

4-1 Presentation the results of the differences (t) between the two research groups (experimental and control) in evaluating the performance of the

fifth-grade pupils in the back-dimension stroke in badminton:

4-1-1 Presentation the results of the differences (t) between the two tests, the pre and post-tests of the experimental group in evaluating the performance of the fifth-grade pupils in the back-dimension stroke in badminton:

Table 7 shows that the backhand hit of the experimental group in the pre-test scored (M= 2,221, Std= 0.593), while in the post-test they reached (M= 6,083, Std = 0.405). The value of the significance level is (0.000) whereas the (t) value is (-13,453), which indicates that there is significant difference between the results of the pre and posttest and in favor of the posttest. Abu Zaid, (2010) indicated that if the value level of significant is greater or equal to the percentage of the error (0.05), then this is evidence of the insignificance of the differences, but if the value of the level of significant is smaller than the error rate (0.05), then this is evidence of the significance of the differences.

Table 7. Significance value between the pre and post-tests of the experimental group

No	Physical variables	Pretest		Post-test		(t-values	Sig
		M	Std	M	Std		
1	Backhand stroke	2,221	0,593	6,083	0,405	-13,453	0,000

Significant at $\leq (0.05)$

4-2-1 Presentation the results of the differences (T) between the pre and posttests between the pre and posttests of the control group in evaluating the performance of the fifth-grade pupils in the back-dimension stroke in badminton.

Table 8. shows that the backhand hit of the control group in the pre-test reached (M= 2,138,

Std = 0.414), while they scored in post-test (M=3.721, Std = 0.788). However, they scored a little bit higher in the post-test, the value of the difference is not significant because the Sig value is (0.007) and the value of (t) is (-4,463).

Table 8. Significance value between the pre and post-tests of the control group

No	Physical variables	pretest		Post-test		(t-values	Sig value
		M	Std	M	Std		
1	backhand stroke	2,138	0,414	3,721	0,788	-4,463	0,007

*Significant at $\leq (0.05)$

4.2.2 Discussing the results of the differences between the pre and post tests

for the experimental and control groups to evaluate the technical performance:

After presenting the results of the tests for the experimental and control groups in the previous section, it shows from the results in Tables (7) and (8) that there are significant differences between the pre and post-tests of the experimental group in evaluating the technical performance of the skills of the backhand stroke in badminton in favor of the post tests. This happened because the players in the experimental group implemented special educational exercises, which directly affected the speed of improvement in the technical performance of teaching movements (under research). This improvement was shown by the result of the experimental group between the two tests (pre- and post-tests) and it was in favor of the post-tests.

As for the control group, there were indications of differences in the pre and post-tests in evaluating the level of technical performance of the control group in favor of the post tests that followed the traditional method. In addition to the continuous practice in the course of the curriculum followed by the pupils, and its contents of explanation, presentation and giving instructions for each of the curriculum vocabulary. It surely leads to learning and then an improvement in the performance level of learnt skills (under research).

The researchers attribute the difference that appeared in the results of the pre and post tests for the experimental group and in favor of the post-test to the difference in the impact of the

preparatory exercises, especially for the experimental group, from the traditional approach. It relied on the introductory exercises that were built on scientific foundations and principles of raising the level of technical performance of pupils in the game of badminton. Moreover, the researchers related the improvement in the posttest of the experimental group to another reason, which is that the use of introductory exercises accompanied by real-time feedback forces the pupils to reconstruct each exercise and in each technical performance of skills (under research). This method enhances the process of acquiring and improving the technical performance of skills. Likely, It helps pupils in storing and retrieving information from memory to give appropriate solutions to the exercises that the students are practicing.

4-1-3 Presentation the results of the differences (T) between the two post-tests of the experimental and control groups in evaluating the performance of the fifth-grade pupils in the back-dimension stroke in badminton:

Table (9) shows that the backhand hit of the experimental group reached ($M = 6,083$, $Std = 0,405$) while the control group reached ($M = 3,721$, $Std = 0,788$). It is noticeable that the (Sig) value of the significance level is (0.000) and the (t) value is (6,522) indicating that there are significant differences between the results of the two groups and in favor of the experimental group.

Table 9. Post-tests sig value for the experimental and control groups

No	Physical variables	Experimental group		Control group		(t-values	Sig value
		M	Std	M	Std		
1	backhand stroke	6,083	0,405	3,721	0,788	6,522	0,000

* Significant if the (sig) value $\leq$ (0.05).

4-1-3-1 Discussing the differences in post-tests results between the two groups to evaluate technical performance:

Through observing Table 9, it becomes clear that the superiority of the experimental group over the control group between the two post-tests in evaluating the performance of the pupils in

backhand dimension stroke in badminton and in favor of the experimental group. Likely, it contributed to achieving an improvement in the technical performance of the skills to be learned compared with the control group, which in turn relied on the usual method used by the teacher. The exercises that the researchers put together with the experimental group worked to increase

the female learners' awareness and experience, which led to an improvement in the level of correct technical performance for each movement, that is, it helped to take the appropriate range and its reflection on their competently and highly skilled performance.

In light of what was discussed, the introductory exercises that the researchers used with the experimental group have clearly affected the speed of improving the technical performance of the skills (under research). Therefore, employing these exercises accurately produces the motor duty (skillful performance), in addition to the nature of the introductory exercises and the transition from one skill to another eliminates boredom during the exercise. Moreover, they increase the fun of the pupils, as it moves from one movement to another during the implementation of the preparatory exercises.

5- Conclusions and Recommendations:

5-1 Conclusions:

The researchers reached a number of conclusions, namely:

- 1- The various introductory exercises accompanied by real-time feedback in learning the performance of hitting the back dimensions in badminton were highly effective in developing and improving the pupils' skill performance.
- 2- There are statistically significant differences in learning the performance of the back dimension stroke in badminton between the pre and post-tests in favor of the post test.
- 3- There are statistically significant differences in learning the performance of the back dimension stroke in badminton between the experimental and control groups and in favor of the experimental group.

5-2 Recommendations:

- 1- Urging teachers in other schools to use these introductory exercises to teach and develop the skill of the backhand badminton.

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- 2- Conducting training courses and workshops for teachers to take the advantages of the various introductory exercises accompanied by real-time feedback to learn to perform the backhand badminton.

- 3- Conducting similar research using a variety of preparatory exercises in other sports.

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