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Impact of A Learning Approach Based on Feedback (Immediate and Delayed) on Learning Chest Passing Skill in Basketball for Students

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ABSTRACT

Despite extensive assertions by curriculum, teaching methodologies, and movement science experts regarding crucial role of feedback as a pivotal variable in improving educational outcomes and acquiring motor skills, field observations and the researcher's practical experience in educational institutions, particularly in context of working with individuals with various special needs, revealed shortcomings in optimal scientific and technical application of feedback strategies by teaching staff. The researcher adopted experimental method, as it is the most suitable approach for verifying cause-and-effect relationships between independent and dependent variables. Experimental design, based on two equivalent groups, was implemented includes pre- and post-test, to ensure isolation of extraneous variables and to verify true effect of feedback patterns (immediate and delayed) on learning the skill under study. Sample was defined as the fifth-grade students at Al-Mudharyah Primary School for Boys during 2023-2024 academic year, totaling (90) students with an average age of (11) years, sample was selected using simple random sampling, comprising (30) students, representing approximately 34% of the original community. Current research aims to check effectiveness of immediate feedback and late in developing the technical performance skill of chest passing in basketball, to reveal effectiveness of both feedback (immediate and delayed) and extent of their impact on acquiring and mastering basketball rebounding skill. Results show real-time feedback has proven to be tangibly effective in accelerating acquisition of chest passing skills among students, statistically significant differences in favor of this type of information provision. Results revealed no statistically significant differences between two feedback patterns (immediate and delayed) in pre-test stage, confirming homogeneity of research groups and randomness of initial differences before intervention of independent variable.

Keywords: Feedback; Learning Approach; Immediate and Delayed; Chest Passing; Basketball.

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ABSTRAK

Terlepas dari penegasan ekstensif oleh kurikulum, metodologi pengajaran, dan pakar ilmu gerakan mengenai peran penting umpan balik sebagai variabel penting dalam meningkatkan hasil pendidikan dan memperoleh keterampilan motorik, pengamatan lapangan dan pengalaman praktis peneliti di lembaga pendidikan, terutama dalam konteks bekerja dengan individu dengan berbagai kebutuhan khusus, mengungkapkan kekurangan dalam penerapan ilmiah dan teknis strategi umpan balik yang optimal oleh staf pengajar. Peneliti mengadopsi metode eksperimental, karena ini adalah pendekatan yang paling cocok untuk memverifikasi hubungan sebab-akibat antara variabel independen dan dependen. Desain eksperimental, berdasarkan dua kelompok yang setara, diimplementasikan mencakup pra dan pasca tes, untuk memastikan isolasi variabel asing dan untuk memverifikasi efek sebenarnya dari pola umpan balik (langsung dan tertunda) pada pembelajaran keterampilan yang dipelajari. Sampel didefinisikan sebagai siswa kelas lima di Sekolah Dasar Anak Laki-laki Al-Mudharyah selama tahun ajaran 2023-2024, dengan total (90) siswa dengan usia rata-rata (11) tahun, sampel dipilih menggunakan simple random sampling, terdiri dari (30) siswa, mewakili kurang lebih 34% dari komunitas asli. Penelitian saat ini bertujuan untuk memeriksa efektivitas umpan balik langsung dan terlambat Dalam mengembangkan keterampilan kinerja teknis umpan dada dalam bola basket, untuk mengungkapkan efektivitas umpan balik (segera dan tertunda) dan tingkat dampaknya pada memperoleh dan menguasai keterampilan rebound bola basket. Hasil menunjukkan umpan balik real-time telah terbukti efektif secara nyata dalam mempercepat perolehan keterampilan passing dada di antara siswa, perbedaan yang signifikan secara statistik mendukung jenis penyediaan informasi ini. Hasil mengungkapkan tidak ada perbedaan yang signifikan secara statistik antara dua pola umpan balik (langsung dan tertunda) pada tahap pra-pengujian, mengkonfirmasi homogenitas kelompok penelitian dan keacakan perbedaan awal sebelum intervensi variabel independen.

Kata Kunci: Umpan balik; Pendekatan Pembelajaran; Segera dan tertunda; Lewat dada; Bola basket.

INTRODUCTION

The effectiveness of the educational system in the context of physical education and sports is the product of an integrated interaction that extends beyond the learner's intrinsic abilities to include the teacher's competencies and leadership skills in classroom management, as well as their ability to facilitate interaction between themselves and the learner (Guo et al., 2023; Wang, 2024; Xu et al., 2025). The curriculum, with its components and teaching methods, stands out as an essential and indispensable pillar in supporting this process (Schmidt & Wrisberg, 2008). In this regard, feedback is one of the most prominent support tools provided by the teacher; its effectiveness depends on their experience in applying and delivering it in a way that ensures the learner acquires the skill and information with minimal physical effort and in the shortest possible time (Azzaloualidine & Erturan, 2025; Piotrowski & Capel, 2013; Potdevin et al., 2018).

School sports, particularly at the primary level, are of strategic importance in establishing the foundations for learning motor skills in individual and team sports. They

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open broad horizons for learners by integrating enjoyment and physical activity with structured learning. This necessitates continuous development of skill performance using feedback and identifying its qualitative impact on skill acquisition and retention (Magill & Anderson, 2017). The importance of the current research lies in adopting a precise observation system to identify the most effective and beneficial feedback patterns for students at this critical age.

Despite the scientific consensus among specialists in teaching methods and movement sciences on the great importance of feedback in the success of the motor learning process (Hattie & Timperley, 2007), the researcher's field experience in the educational environment revealed a gap in the low level of interest in the systematic scientific use of this method by many teachers.

Providing feedback without a scientific basis that considers accuracy, timing, and appropriate methodology renders it a wasted effort with limited impact. Hence, the research problem focused on identifying the challenges students face in performing athletic skills and exploring the best methodological approaches for conveying information and correcting motor patterns. The researcher selected the "chest pass" skill in basketball as a case study to investigate the role of two feedback styles (immediate and delayed) in order to compare them and determine the optimal method for enhancing the learning process.

The research aims to identify the effect of immediate and delayed feedback on learning the chest pass skill in basketball among primary school students.

METHODS

To achieve the study's objectives and based on the nature of the problem to be addressed, the researcher adopted the experimental method, as it is the most suitable approach for verifying the cause-and-effect relationships between independent and dependent variables (Alawi, 2011). The experimental design, based on two equivalent groups, was implemented, which includes pre- and post-testing, to ensure the isolation of extraneous variables and to verify the true effect of feedback patterns (immediate and delayed) on learning the skill under study (Hassanin, 2010).

Research population and sample current research population was defined as the fifth-grade students at Al-Mudharyyah Primary School for Boys during the 2023-2024 academic year, totaling (90) students with an average age of (11) years. Accurately defining the research population is a crucial step to ensure the generalizability of the results (Alawi, 2011). The research sample was selected using simple random sampling, comprising (30) students, representing approximately (34%) of the original population. This percentage is considered representative and sufficient for conducting field experiments and achieving the required statistical control in educational research (Hassanein, 2010), as detailed in Table (1) below.

Table 1. Shows Distribution of Research Population and Samples Exploratory and Main

No.	Category	Students number	Notes
1	Total research community	90	Students registered in first grade
2	Exploratory sample	8	To conduct instrument testing and trials

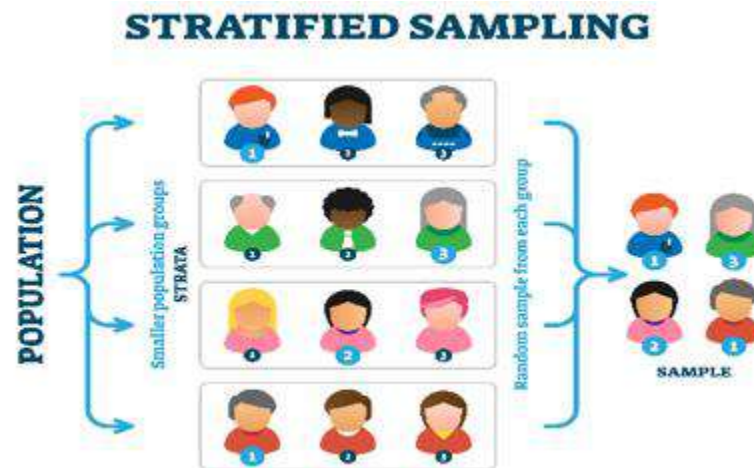


Figure 1. Represents sample distribution

Means, tools, and equipment:

To ensure the accuracy of the field experiment and the collection of scientific data, the researcher used a set of methods, tools, and devices that are a fundamental pillar in measurement and testing in physical education, as follows: Technical and field tools and equipment: The tools used in the research included the following to ensure a standardized learning environment: Legal basketballs (4) usable balls. Basketball court: Equipped according to legal measurements for conducting tests. A referee's whistle : to regulate and time the movement performance. Office supplies: (papers and pens) for taking notes and recording the results of field tests.

The researcher relied on a set of methods to ensure the rigor of the research and the objectivity of its results, namely: References and scientific sources: These consist of Arabic and foreign studies and research related to feedback and basketball, to strengthen the theoretical framework and interpret the results. The supporting team: The researcher enlisted a group of specialized assistants to ensure the accuracy of observation and to provide technical support during the application of educational units and data collection.

Field research procedures

The researcher designed and implemented the educational units for the skill of "chest passing" in basketball, by integrating the scientific material within the organizational structure of the formal physical education lesson, considering the standardized time distribution of the units. The following are the details of the procedural implementation: Time context: The curriculum is allocated two educational sessions per week, with (45) minutes per session. Skill application: The applied aspect of the research was focused on the "main section" of the lesson, which is the vital part in which motor skills are built and developed, where the performance time in this section took between (12-15) minutes for each educational unit. Performance distribution: This time division considers the balance between the theoretical explanation, the practical model, and then the actual application of chest passing, while employing the feedback

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patterns (immediate and delayed) prescribed in the study to ensure the quality of the motor response.

Exploratory Experiment

The pilot study is considered a "preliminary study" aimed at testing the effectiveness of field procedures before proceeding with the main study (Alawi, 2011). In this context, the researcher conducted a pilot study on Monday, October 23, 2023, on a sample of (8) students selected from the original research population and from outside the main study sample, in order to ensure that the results were not influenced by prior learning experience. Objectives of the exploratory experiment were defined in the following points: Measuring professional competence: Determining the extent to which the teacher implementing the process understands the mechanism for teaching the targeted motor skills and accurately applies feedback patterns. Time management: Estimating the actual time required for each of the theoretical explanation, the practical model, and the field application of the skill. Identifying challenges: Determining the difficulties and obstacles (human or material) that may hinder the progress of the main experiment and developing proactive solutions for them. Checking the tools: Ensuring validity of tools and equipment used and the suitability of practice location.

Study tests

1-Wall Roll Test (Wajih Mahjoub, 2002) Principles of motor learning: This test aims to measure Skillful performance for passing the chest. Required tools: Legal basketball. A smooth, solid wall. Stopwatch. A measuring tape for determining distances. Adhesive tape for marking the target on the wall. Sony video camera. Testing procedures: A square is drawn on the wall with dimensions (60 cm x 60 cm), and the bottom side of the square is raised from the ground by 120 cm approximately player's chest level. A line is drawn on the ground at a distance from the wall (2.5 meters (or 3 meters depending on the age group, player technician stands behind the line holding the ball. At the starting signal, the player passes the ball (breast pass) into the box and receives it after it bounces, repeating this as quickly as possible.

Registration method: Number of correct passes that hit inside the box is counted within a time of 30 seconds, pass is not counted if the player crosses the standing line or if he uses another type of pass such as an overhead pass, player is usually given two attempts, and the better result is recorded for him. Evaluation criteria (subjective): Number of successful passes by the student is calculated within 30 seconds.

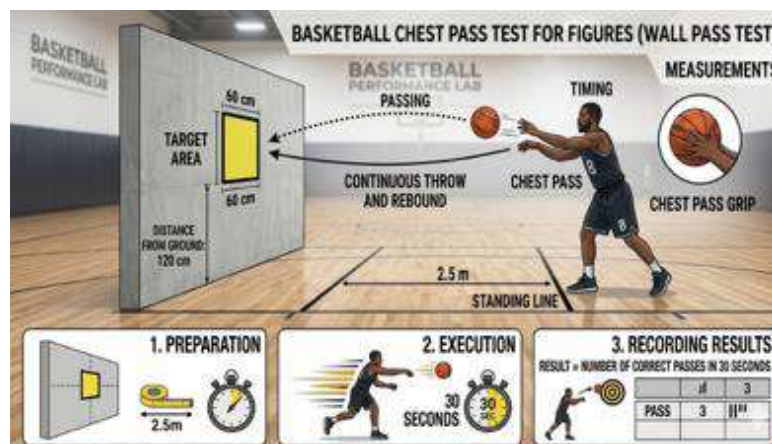


Figure 2. Diagram of basketball chest pass test

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Note: The students' performance is filmed by a video camera, and the performance was presented to the experts to evaluate the technical performance of the chest passing according to the evaluation form through two evaluators, noting that the highest score for the form is 10 points.

Pre-tests

In order to determine the initial level of the research sample in the skill under study and to ensure the equivalence of the groups before starting the educational program, the researcher conducted pre-tests for the skill of "chest passing" on 10/24/2023. These tests were conducted under the direct supervision of the researcher, with the participation of the specialized physical education teacher and the assisting work team to ensure accuracy and objectivity in recording the results.

Importance of this stage lies in providing a statistical database that allows the researcher to make subsequent comparisons with post-tests, thus helping to accurately measure the extent of the change resulting from the independent variable (feedback patterns)(Alawi, 2011). The researcher ensured the uniformity of the temporal and spatial conditions for all members of the sample to reduce the experimental error and ensure the validity of the results(Qatami, 2005).

Main procedures

The researcher implemented the proposed educational program aimed at teaching the skill of "chest-passing," subjecting the program to specific time and structural controls to ensure maximum educational benefit (Alawi, 2011). The details of the implementation procedures are as follows: Program structure: The program included (8) educational units, which were implemented at a rate of two units per week over a whole month, with the time duration of each unit being (45) minutes. Components of the educational unit: The design of each educational unit considers the systematic sequence adopted in physical education, which includes (general and specific warm-up, main part, concluding part) to ensure optimal physical and skill preparation for students (Hassanein, 2010). Teaching method: Main part included a detailed theoretical explanation of the skill, followed by an applied (practical) model presented by the teacher to illustrate the correct motor path for chest passing.

Distributing the experimental groups according to feedback patterns: The research sample was divided into two experimental groups to determine the effect of the independent variable, as follows (Qatami, 2005): First experimental group received skill instruction coupled with the Instant Feedback method, which is provided now of performance to correct the motor path immediately. Second experimental group received skill instruction coupled with a delayed feedback method, which is provided after the performance has ended, by a specific period, to allow the learner to self-assess.

Main Experiment

After completing all preliminary procedures and verifying the integrity of the instruments, the researcher proceeded with the main experiment, which ran from October 25, 2023, to November 25, 2023. The research sample (comprising 30 students) was divided into two equal experimental groups to ensure statistical control and objectivity in comparing the results (Alawi, 2011). The following are the details of the field application:

First experimental group (n=15): The members of this group underwent a program to teach the skill of "chest passing" through theoretical explanation and practical

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modeling, with the adoption of the immediate feedback strategy as an independent variable; whereby the students were provided with corrective information immediately upon the occurrence of the motor response to enhance the link between performance and result.

Second experimental group (n=15): The members of this group underwent the same educational and skills program, but with the use of a delayed feedback strategy, whereby evaluative feedback was provided after a specific time interval following the completion of the performance, to give the learner the opportunity to process the information independently.

During the month-long experiment, the researcher was careful to control all external conditions and extraneous variables to ensure that the true impact of feedback patterns on learning the skill under study could be investigated.

Post-test

Tests were conducted on the sample members (experimental and control). For the chest passing skill, on 11/26/2023, after the completion of the main trial and under the same conditions that were carried out in the pre-tests.

Statistical methods

To process the raw data obtained from the pre- and post-tests, and to verify the research hypotheses, the researcher used the Statistical Package for the Social Sciences (SPSS) (latest version), which is the standard tool for ensuring the accuracy and objectivity of the results. The following statistical tests were used: Mean to estimate the central value of student performance levels in chest passing skill before and after the program is implemented. Standard Deviation: To determine the degree of dispersion of the results and the homogeneity of the sample members around the extracted arithmetic means. t - test for correlated samples: This is used to compare the results of the pre-tests and post-tests for the same group, with the aim of measuring the extent of individual and group development resulting from the use of feedback patterns.

RESEARCH RESULTS

Presentation and analysis of pre- and post-test results

This section presents the results obtained after statistically analyzing the data for chest passing skills. Table (2) shows the arithmetic means and standard deviations, in addition to the calculated t- value for comparing the pre- and post-tests of the research sample, to determine the significance of the differences and the extent of performance improvement.

Table 2. Shows Means, Standard Deviations and Calculated Value of (t) for Chest Passing Skill in Pre-test and Post-test

Variables	First experimental group (Immediate)		Second experimental group (Delayed)		Calculated (t) value	Sig. level	Sig. type
	Mean	St.d	Mean	St.d			
Technical performance	3.28	1.80	3.80	1.66	2.28	3.02	Insig.

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of chest passing skill							
Wall pass test	14	1.66	15	1.23	2.28	2.80	Insig.

* At a significance level of (0.05)

Table 2 presents statistical results of comparison between two feedback methods (immediate and delayed) in the chest pass skill. The results showed that the mean score for the immediate feedback group was (3.28) with a standard deviation of (1.80), while the delayed feedback group recorded a mean score of (3.80) with a standard deviation of (1.80). (1.66).

When processing the data to test the significance of differences between the two groups, the value reached (t) The calculated value (2.28), which is a smaller value than the value (t) The statistical significance level (3.02) is at a significance level of (0.05). Accordingly, the differences between the first and second experimental groups in chest passing skills are not statistically significant, indicating the similarity in the effectiveness of both methods in influencing the learning of this skill among the sample members.

Table 3. Shows Means, Standard Deviations, and Calculated (t) Value for Chest Passing Skill in Post-test

Variables	First experimental group (Immediate)		Second experimental group (Delayed)		Calculated (t) value	Sig. level	Sig. type
	Mean	St.d	Mean	St.d			
Technical performance of chest passing skill	6.32	1.77	5.02	1.32	2.28	0.033	Sig.
Wall pass test	17	1.68	16	1.30	2.28	0.79	Sig.

Presentation and analysis of post-test results for two experimental groups

Table 3 shows the results of the post-tests for the chest passing skill and the wall pass test between the two research groups. From the data, we note that the first experimental group (immediate feedback) achieved a mean of (6.32) with a standard deviation of (1.77), while the second experimental group (delayed feedback) recorded a mean of (5.02) with a standard deviation of (1.32).

In the wall pass test, a clear advantage emerged for the first experimental group (the immediate group) with a mean of (17) and a standard deviation of (1.68). When the results were statistically processed, the calculated value of (t) for comparing the two groups in the chest pass skill was (2.28), with a significance level of (0.033), which is a value smaller than the adopted significance level of (0.05), indicating the existence of statistically significant differences in favor of the first experimental group that received immediate feedback.

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DISCUSSION

The researcher attributes superiority of the group that used immediate feedback in the chest pass skill to the nature of the skill itself; chest passes require high precision and fine-tuned visual-motor coordination to guide the ball towards a teammate. Providing the learner with immediate instructions and information during or immediately after the performance helps correct and solidify the movement. Conversely, delaying the information (delayed feedback) may lead to distraction and a weakened ability to connect the actual performance with the required correction.

This interpretation is consistent with the psychological and cognitive characteristics of the research sample, as the weakness of the ability to retain information and the weakness of long-term memory stand out as one of the main obstacles that negatively affect the learning process, especially in skills that depend on accuracy and memorization (Al-Batani et al., 2011).

Motor perception represents the brain's process of translating sensory input into coded messages (electrical impulses). Since long-term memory may be limited in the effectiveness of individuals with learning difficulties, relying on systematic repetition and utilizing short-term memory through immediate feedback is the optimal strategy to enhance the learning process and ensure accurate motor responses.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the statistical analysis and discussion, the research reached the following conclusions: Real-time feedback has proven to be tangibly effective in accelerating the acquisition of chest passing skills among students, as the results showed statistically significant differences in favor of this type of information provision. Results revealed no statistically significant differences between the two feedback patterns (immediate and final/delayed) in the pre-test stage, confirming the homogeneity of the research groups and the randomness of the initial differences before the intervention of the independent variable.

Considering the conclusions reached, the research recommends the following: Emphasizing the importance of diversifying feedback strategies when teaching basketball skills to students, and not limiting oneself to a single pattern, to ensure an integrated motor response. It is necessary to start teaching basic sports skills at early ages, as they are the foundation and cornerstone for developing future athletic levels. Activating the use of educational media and assistive technologies such as visual presentations, educational posters, and illustrations to enhance students' mental visualization of the skill and facilitate the learning process.

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