



THE EFFECT OF USING DIRECT FEEDBACK ACCORDING TO DIFFERENT LEARNING STYLES (AUDITORY-KINESTHETIC) ON ACQUIRING THE TECHNICAL PERFORMANCE OF THE LONG JUMP

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Abstract

The problem of the research lies in answering the following question: Does using direct feedback according to two learning styles (auditory feedback) or (kinesthetic feedback) lead to better results in acquiring the technical performance of the long jump among students of the College of Physical Education and Sports Sciences, University of Kirkuk? The aim of the research is to examine the effect of using direct feedback according to two learning styles (auditory and kinesthetic) on acquiring the technical performance of the long jump among first-year students at the College of Physical Education and Sports Sciences. The researchers used the experimental method due to its suitability for the nature of the research. The researchers concluded that there is a positive effect of the educational programs implemented by the two experimental groups that used direct feedback according to the learning styles (auditory and kinesthetic) on acquiring the technical performance of the long jump among first-year students at the College of Physical Education and Sports Sciences, University of Kirkuk, in addition to the positive results of the control group. They recommended the use of the two educational programs developed by the researchers, which utilized (direct feedback according to auditory and kinesthetic learning styles) in acquiring the technical performance of the long jump for first-year students in the College of Physical Education and Sports Sciences.

Keywords: direct feedback, auditory learning style, kinesthetic learning style, long jump

1.1 Introduction and Importance of Research

There are many factors that affect the learner, including the information that improves their response to what is to be taught and applied to achieve reliable performance by correcting the movement path. This is known as feedback, which is considered one of the modern educational concepts that has received attention from both educators and psychologists.

Feedback has entered many fields of knowledge, including education. Without feedback, teachers would not be able to assess the level of instruction, knowledge, and skills, nor would they be able to correct pre-existing representations and perspectives. Modern teaching depends on knowing the learners' reactions to intervene immediately and later, accompanying the learner through all stages of their learning.

(Mahgoub, 2001) indicates that the information provided to the learner during their motor performance when learning the skill is one of the most important variables in motor learning. This information can take various forms, whether from educational circumstances or laboratory research conditions. It informs the



learner about the performance's efficiency either during or after the activity, or in both. (Mahgoub, 2001, p. 16)¹

Beginners who are not yet familiar with new skills are unable to visualize the movement, and thus they rely on external sources for correction to help modify the trajectory of their subsequent movements. This type of correction is referred to as external feedback. The amount and type of information provided should align with the learner's age level and sensory preferences. The initial benefit of learning styles is seen as a tool for thinking about individual differences. When we help students discover their own learning styles, we give them the opportunity to find tools that can be applied in academic subjects and in many situations outside the university. This is why it has been an area of focus for researchers, as it is linked to the sensory systems of the learner (auditory and kinesthetic). Al-Fifi (2001) states that learning styles are a means of guiding the learner to change themselves, correct their thinking, and develop skills on how to perform them. This process is based on experience and testing, which leads to tangible results in performance (Al-Fifi, 2001, p. 12).

Recent scientific sources confirm that learning methods based on learning styles are since individuals perceive and process information in diverse ways. Learning experiences should be linked to the learner's style, regardless of whether the student is highly intelligent or not. The theory of learning styles influences the teaching-learning process.²

The field of motor learning is witnessing significant development to prepare educational settings that stimulate the learner's motivation, leading them to achieve the desired goal. The more suitable the learning process, the better, faster, and more efficient the learning becomes, requiring less effort.³

Thus, it has had a significant impact on improving motor performance and developing many sports, including the long jump. It enhances the athlete not only in terms of physical and skill development but also in psychological, social, and health aspects, among others. Additionally, it holds a prominent place in global tournaments and championships.⁴

It is our duty to clarify that track and field (athletics) in general is one of the most widespread sports worldwide because its events are closely related to the basic movements of humans. Every person needs walking, running, throwing, jumping, and leaping. From this perspective, the importance of acquiring these sports lies in their role as essential physical activities used in preparation for all types of sports, competitive, recreational, health, and educational activities. If a person walks with their muscles, runs with their lungs, and accelerates with their heart, they will reach the goal with their intelligence.⁵ Thus, the long jump event is one of the sports that receives attention from those involved in the educational and training process, and it has been a focal point for researchers. Learning and its various methods play a crucial and fundamental role in learning and developing the motor performance of this event.

After reviewing similar studies, it was found that some addressed feedback, while others focused on learning styles, depending on the type and significance of the study for the learner. Through continuous

¹ Mahgoub, Wajih: *Learning and Scheduling of Sports Training*, 1st Edition, Dar Wael for Publishing, Amman, Jordan (2001), p. 16.

² Mohammad, Mohammad Ibrahim Mohammad: *Learning Styles and Their Role in Teaching Youth*, Center for Youth Studies and Research (n.d.), p. 4.

³ Othman, Mohammad Abdul Ghani: *Motor Learning and Sports Training*, Dar Al-Hikma Printing Press, Baghdad (1987), p. 193.

⁴ Rateb, Osama Kamel: *Sports Psychology – Concepts and Applications*, 4th Edition, Dar Al-Fikr Al-Arabi, Cairo (2007), p. 9.

⁵ Qablan, Sobhi Ahmed & Al-Ghafri, Nidal Ahmed: *Sports for All*, 1st Edition, Dar Safa for Publishing and Distribution & Dar Al-Mujtama' Al-Arabi for Publishing, Amman (2003), p. 210.



observation, ideas have emerged that enable us to present the learning process in the best way possible, attempting to utilize feedback according to two learning styles in education.

Hence, the importance of this research lies in its relevance, as many researchers have discussed feedback and learning styles separately. However, they have not addressed their combined use in the long jump event specifically. This research is a serious attempt to achieve the best results in acquiring the technical performance of the long jump for learners of the College of Physical Education and Sports Sciences. It also aims to create new educational environmental conditions through which the researcher may achieve the desired goal of the educational process.

1-2 Research Problem:

Despite the continuous attention given by scientists, researchers, and specialists to the educational process, science does not remain static. By reviewing similar studies and their recommendations, in addition to conducting numerous personal interviews with experts in track and field events and reviewing scientific sources, it was found that there are individual differences in how people learn. It is essential for the teacher to recognize these differences to effectively engage with their students and teach them to achieve the maximum benefit. It was observed that students in physical education and sports sciences face difficulties when learning most track and field events, specifically in the long jump, especially in linking the stages with the mechanical factors.

This led the researcher to the idea of creating an educational environment that encourages desired learning through direct feedback according to two learning styles (auditory and kinesthetic) to help students acquire the technical performance of the long jump. This approach could yield positive outcomes for the educational process and achieve the desired educational impact.

Thus, the research problem arises from the need to answer the following two questions:

1. Will the use of feedback according to two learning styles (using direct feedback based on the auditory style) or (using direct feedback based on the kinesthetic style) lead to better results in acquiring the technical performance of the long jump for students at the College of Physical Education and Sports Sciences, University of Kirkuk?

1-3 Research Objectives:

1-3-1 To identify the impact of using direct feedback according to two learning styles (auditory and kinesthetic) on acquiring the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences.

1-3-2 To compare the post-test results between the two experimental groups, which used direct feedback according to two learning styles (auditory and kinesthetic), in acquiring the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences.

1-4 Research Hypotheses:

1-4-1 There are statistically significant differences between the pre-test and post-test results regarding the impact of direct feedback according to the two learning styles (auditory and kinesthetic) on acquiring the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences.



1-4-2 There are statistically significant differences between the two groups in the post-test results regarding the impact of direct feedback according to the two learning styles (auditory and kinesthetic) on acquiring the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences.

1-5 Research Scope:

1-5-1 **Human Scope:** First-year students at the College of Physical Education and Sports Sciences, University of Kirkuk, for the academic year 2023-2024.

1-5-2 **Time Scope:** From December 20, 2023, to February 1, 2024.

1-5-3 **Spatial Scope:** The sports and school activities field at the Department of Sports and School Activities, Directorate of Education, Kirkuk.

1-6 Definition of Terms:

1-6-1 **Feedback:** According to (Ya'rab, 2002), "It is the information received by an individual as a result of a specific performance."⁶

1-6-2-1 **The Auditory Learning Style:** These are individuals who have an auditory-based representation system. They tend to breathe moderately and speak calmly without interrupting others. Their speech is characterized by varied pitch and rhythm. Their physical movements are less pronounced compared to those with a visual learning style. They remember what they have heard more effectively than what they have seen, and their decisions are often based on careful analysis.⁷

1-6-2-2 **Kinesthetic Learning Style:** In this style, the learner relies on visual perception and visual memory by observing educational materials, the teacher's movements, and how they perform the activity. They tend to use specific phrases such as "*Let me move,*" and they can accomplish a new task after seeing someone else perform it.⁸

3 – Research Methodology and Field Procedures

2 – 1 Research Methodology:

The researchers used the experimental method as it is suitable for the nature of the study.

3 – 2 Research Population and Sample:

⁶ Ya'rab, Khiyoun: Motor Learning: Between Principle and Application, Baghdad, Al-Sakhra Printing Office, (2002), p. 91.

⁷ Ibrahim El-Feki: Neuro-Linguistic Programming and the Art of Unlimited Communication, 2nd ed., Al-Raya Publishing and Distribution, Syria, (2009), p. 90.

⁸ Wisam Salah Abdul-Hussein, et al.: Learning Styles and Their Applications, 1st Edition, Dar Al-Ma'arif Cultural Foundation, Iraq (2018), p. 5.



The research population was deliberately selected and consisted of first-year students at the College of Physical Education and Sports Sciences, University of Kirkuk, for the academic year 2023/2024. The total number of students was **161**, distributed across four sections.

The research sample was deliberately chosen from sections (A, B, and C), totaling **forty-two** students (*). They were divided into two experimental groups and one control group, ensuring equal distribution according to their respective sections. The two experimental groups were assigned based on their learning styles.

After conducting pre-tests for all three groups, each group was set at **14** students. Some students were excluded for several reasons, amounting to **35%** of the first-year students. Table (1) presents this distribution.

Section	Total Students	Absent from Pre-Test	Repeating Year	Prior Experience & Practice	Absent from Lectures	Incomplete Answers	Absent from Post-Test	Total Excluded	Final Sample
A	54	13	6	7	2	12	-	40	14
B	55	16	3	6	2	13	-	41	14
C	52	14	6	4	3	11	-	38	14
Total	161	43	15	17	7	36	-	119	42

3-3 Experimental Design:

The researchers used an experimental design known as the "Equivalent Groups Design with Pre- and Post-Observation and Controlled Conditions" (). Table (2) presents the details.⁹

Groups	Pre-Test Performance	Independent Variable	Post-Test Performance
Control Group	Technical performance of long jump	Standard program	Technical performance of long jump
Experimental Group 1		Direct feedback based on auditory preference	
Experimental Group 2		Direct feedback based on kinesthetic learning style	

3-4 Equivalence Between Experimental Groups:

"The researcher should form equivalent groups, at least concerning the variables related to the study" (¹⁰). The researcher has ensured this by:

3-4-1 Equivalence in Some Cognitive Abilities: The researchers worked on ensuring equivalence in certain cognitive abilities. Abd al-Sattar al-Dhamd (two thousand) indicated that the cognitive abilities possessed by individuals are key factors in the process of learning motor skills¹¹. These cognitive abilities were determined through questionnaires distributed to experts, and included:

⁹ Diebold Van Dalen; Research Methods in Education and Psychology, (Translated by) Mohamed Nabil Nawfal and others, 3rd edition: (Cairo, Anglo-Egyptian Library, 1984), pp. 384-394.

¹⁰ Deopold Van Dallen; Research Methods in Education and Psychology, (translated by) Muhammad Nabil Nofal and others, 3rd edition: (Cairo, Anglo-Egyptian Library, 1984), p. 398.

¹¹ Abdul Sattar Jabar Al-Dhamd; Physiology of Mental Processes in Sports – Analysis – Training – Measurement: (Amman, Dar Al-Fikr for Printing, Publishing, and Distribution, 2000), p. 21.



3-4-1-1 Equivalence in Attention Aspects: The researchers used the Borden-Anfimov Attention Test (modified).

3-4-1-2 Equivalence in Mental Sports Visualization: The researchers used the standardized Mental Sports Visualization Scale by Rainer Martins (1992), translated into Arabic.

3-4-1-3 Equivalence in Sensory-Motor Perception: The researchers used the Horizontal Motor Sensation Test based on the distance of the space.¹²

3-4-1-4 **Equivalence in Intelligence:** The researchers used the Raven's Progressive Matrices Test to measure intelligence.¹³

The tests and measurements for these variables were conducted on the three groups from 17/12/2023 to 18/12/2023. To ensure the equivalence of the three groups, the researcher used one-way analysis of variance (ANOVA), and Table (3) illustrates this.

Variable	Measurement Unit	Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-Value (Calculated)	Sig	Significance of Differences
1. Attention Features	Degree	Between Groups	63134.222	2	31567.111	0.91	0.261	Non-Significant
		Within Groups	930650.596	27	34468.540			
Attention Intensity	Degree	Between Groups	76.912	2	38.456	0.55	0.200	Non-Significant
		Within Groups	1859.047	27	68.853			
Attention Focus	Degree	Between Groups	0.729	2	0.364	0.03	0.412	Non-Significant
		Within Groups	285.750	27	10.583			
2. Mental Imagery in Sports	Degree	Between Groups	7.063	2	3.531	0.40	0.760	Non-Significant

¹² Ahmad Abu Al-Ala, Abdul Fattah, and Mohammed Sobhi, *Physiology and Morphology of Athletes and Measurement Methods for Evaluation*, 1st ed., Dar Al-Fikr Al-Arabi (1997), p. 128.

¹³ Murad Ahmed Yas Saleh; "The Effect of Different Mental Training Methods on Learning Technical Performance and Achievement Level in Shot Put," Unpublished Master's Thesis, College of Physical Education, University of Mosul (2009), p. 196.



Visual Dimension	Degree	Within Groups	233.917	27	8.663			
Auditory Dimension	Degree	Between Groups	11.229	2	5.614	0.47	0.325	Non-Significant
		Within Groups	321.750	27	11.916			
Kinesthetic Dimension	Degree	Between Groups	12.062	2	6.052	0.62	0.163	Non-Significant
		Within Groups	260.417	27	9.645			
Emotional Dimension	Degree	Between Groups	12.104	2	6.052	0.50	0.213	Non-Significant
		Within Groups	324.375	27	12.013			
3. Sensory-Kinesthetic Perception	cm	Between Groups	27.500	2	13.75	0.371	0.123	Non-Significant
		Within Groups	998.500	27	36.981			

Table (3) shows the presence of non-significant differences in (some aspects of attention, mental imagery, sensory-kinesthetic perception, and intelligence), indicating the equivalence of the groups in these variables.

3-4-1-5 Equivalence in Technical Performance in the Long Jump Event:

After designing an evaluation form for assessing the technical performance of the long jump event and obtaining expert agreement on the scores for the sections of the apparent motor structure, video recording was conducted for the research sample during the pre-test. Each student was given three attempts in accordance with the international rule, which states that "if the number of competitors exceeds eight, each competitor is granted three attempts."¹⁴ Then, the jump was performed from a distance of (7) meters from the sandpit, as the objective was educational. A video recording device of the type (*Sany*) was fixed at (10.5 m) from the performance area and at a height of (1.30 m) to track the movement of the test subject (student) from the beginning of the long jump execution to its completion.

After completing the video recording of the technical performance test, which serves as the pre-test, the technical performance was evaluated by two assessors (*). The researcher displayed the video footage to each

¹⁴ Haider Faiq Al-Shammaa & Waseel Jalil Kati; The International Competition Law (2019), p. 108.



assessor on a computer, allowing them to assign a score out of (100) for the three sections and their components for each attempt. The footage was displayed in slow motion, and the best attempt of the three was selected based on the highest score given by both assessors.

The researchers then calculated the simple correlation coefficient between the two assessors' scores for the technical performance, which reached (0.891), indicating a significant correlation. Subsequently, an analysis of variance was conducted, as shown in Table (4).

No	Variables	Unit of Measurement	Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	Calculate F-Value	Sig	Significance of Differences
1	Technical Performance	Score	Between Groups	1.067	2	0.533	0.086	0.918	Not Significant
			Within Groups	166.800	27	6.178			

From Table (4), it is evident that there are no significant differences among the three groups in acquiring the technical performance of the long jump event, which indicates the equivalence of the groups in this variable.

3-5 Data Collection Methods:

3-5-1 Questionnaire:

3-5-1-1 Questionnaire for Determining Mental Abilities:

A questionnaire form was designed, including a set of mental abilities, and was presented to a group of experts in the field of **motor learning and sports psychology** (Appendix 1). After reviewing scientific sources and collecting expert opinions, the researcher determined the mental abilities based on an agreement percentage ranging between **33.33% – 100%**.

The agreed-upon mental abilities were:

- **Attention**
- **Concentration**
- **Perception**
- **Imagery**
- **Intelligence**

The researcher excluded **reaction, thinking, memory, and creativity**, as they did not achieve an agreement percentage of **75% or higher**. Table (5) illustrates this.

No.	Mental Abilities	Total Experts	Experts in Agreement	Agreement Percentage
1	Attention	9	9	100%
2	Concentration	9	9	100%
3	Reaction	9	3	33.33%



4	Perception	9	7	77.77%
5	Imagery	9	9	100%
6	Thinking	9	4	44.44%
7	Memory	9	4	44.44%
8	Creativity	9	3	33.33%
9	Intelligence	9	9	100%

3-5-1-2 Questionnaire for Determining Mental Ability Tests

To identify the most relevant mental ability tests in athletics, specifically for the **long jump event**, a questionnaire was designed. This questionnaire included a set of **mental ability tests** aimed at ensuring **equivalence among the three groups**.

The questionnaire was presented to a group of **experts** in the fields of **motor learning, sports psychology, measurement, and evaluation**, as shown in **Appendix (1)**. After distributing the questionnaire and collecting responses from the experts, the tests that achieved an **agreement percentage of 75% or higher** were selected.

Table (6) presents these results.

No.	Mental Abilities	Appropriate Tests	Total Experts	Experts Agreement	in	Agreement Percentage
1	Attention Span	Bourdon-Anfimov Attention Test (Modified)	9	9		100%
2	Attention Focus		9	9		100%
3	Mental Imagery	Standardized Mental Imagery Scale for Sports	9	9		100%
4	Perception	Horizontal Motor Sensation Test for Spatial Distance	9	7		77.77%
5	Intelligence	Raven's Progressive Matrices Test	9	9		100%

3-5-1-3 Questionnaire for Identifying Learning Styles

A questionnaire was designed based on the tool used by **Ali Abdel Alim (2017)**, which was applied in the Iraqi context.¹⁵ This questionnaire was distributed to experts in **motor learning, sports psychology, and teaching methods** (Appendix 1) to evaluate the appropriateness and validity of the items related to **learning styles (auditory, kinesthetic)**. The items received an agreement percentage ranging between **77.77% and 100%**.

¹⁵ Ali Abdul Alim Muhammad Saber Al-Naqib: The Effect of Skill-Specific Exercises Using Distributed Practice Scheduling Based on Sensory Preference Systems on the Motor Performance of Some Futsal Skills for Female Students, Unpublished Thesis, College of Physical Education and Sports Sciences, University of Tikrit (2017), pp. 98-99.



3-5-1-4 Questionnaire for Determining the Scores of Kinematic Structure Sections in Acquiring the Technical Performance of the Long Jump Event

After reviewing scientific sources relevant to his research on acquiring the **technical performance of the long jump event**, the researcher designed a questionnaire to assess the **sections of the kinematic structure** of the event. This questionnaire was distributed to experts in **motor learning and athletics** (Appendix 1) to determine the score assigned to each section of the kinematic structure, including its **sub-components**. These sections are:

- **Preparatory Section**
- **Main Section**
- **Final Section**

The total score was set at **one hundred**, and **Table (7)** presents the details.

Kinematic Section	Score Percentage	Notes
Preparatory Section	25%	
Approach Run	25%	
Main Section	67%	
Takeoff Phase	25%	
Step	19%	
Jump Phase	23%	
Final Section	8%	
Landing	8%	
Total	100%	

3-5-1-5 Survey for the Validity of the Educational Program for the Experimental Groups:

After reviewing the scientific sources, the educational program for acquiring the technical performance of the long jump event for first-year students was developed and presented to experts in the field of (motor learning and teaching methods) through a questionnaire dated 5/12/2023 (Appendix 1). Feedback from the experts was considered before beginning the main experiment. The program was designed by the researcher in collaboration with the course instructor*¹⁶ to standardize the times and exercises during the educational unit*¹⁷. This program was distributed as a questionnaire to a group of experts in (track and field), and after the experts agreed on the educational program, direct feedback was incorporated according to learning styles (auditory and kinesthetic). The educational programs were then distributed to a group of experts in (motor learning and teaching methods), and personal interviews were conducted with them. After agreeing on the programs, the modifications suggested by the experts were implemented, as shown in Appendix 2, which displays a sample of the educational programs.

3-5-2 Personal Interviews:

¹⁶ T.A. Maeen Ali Obeid / College of Physical Education and Sports Sciences, University of Kirkuk.

¹⁷ Due to the lack of a complete written program for the long jump event to be applied to first-year students.



Interviews were conducted with experts in the fields of (motor learning, teaching methods, and track and field) to benefit from their insights regarding the research procedures throughout the period of receiving the educational programs from the experts (as shown in Appendix 1). The interview covered the following topics:

- How to implement the educational programs using direct feedback according to learning styles and their validity.

3-5-3 Measurements and Tests:

Tests are one of the important conditions for evaluating the validity of the assessment and distinguishing between individuals (Majed, 2022, p. 7).

3-5-3-1 Testing Some Cognitive Abilities:

3-5-3-1-1 **Attention Tests:** Using the (Borden-Anfimov) Attention Test.

3-5-3-1-2 **Mental Imagery Scale:** The standardized (Rainer-Martins, 1992) test.

3-5-3-1-3 **Perception (Sensory-Kinesthetic) Test:** The horizontal space perception test.

3-5-3-1-4 **Intelligence Test:** The "Raven's Progressive Matrices" test.

3-5-4 Scientific Observation:

Scientific observation was conducted to evaluate the acquisition of technical performance for the long jump event by experts in the field of (track and field) for both the pre-test and post-test of the research sample. The scientific observation for the pre-test was conducted on Thursday, December 19, 2023. Meanwhile, the scientific observation for the post-test was conducted on Sunday, February 5, 2024. The observations were conducted at their respective locations at the University of Kirkuk.

3-5-5 Form for Evaluating the Acquisition of Technical Performance for the Long Jump Event:

A form to evaluate the acquisition of technical performance for the long jump event was designed and distributed to the two experts to assess the scores based on the grades from Table (7), which were provided along with a CD to evaluate experts during the scientific observation day. The form was used for both the pre-test and post-test evaluations of the acquisition of technical performance for the long jump event.

3-6 Devices and Tools Used in Research:

- Video camera (SANY model)
- Pen and light for measuring attention concentration.
- Dark glasses for sensory testing
- Four stopwatches

3-9 **Educational Programs:**
3-9-1 **Educational Program for the Long Jump Event for the Experimental and Control Groups:**



After consulting with the track and field instructors at the College of Physical Education and Sports Sciences, University of Kirkuk, regarding the educational program for the long jump event, it was found that there was no complete written educational program for the eight scheduled educational units. The researcher, after reviewing scientific sources and some studies, including (Murad Ahmed, 2009, developed the program.¹⁸¹⁹²⁰ The educational program consists of eight instructional units. After conducting personal interviews with some of the experts and reviewing various scientific sources and previous studies related to direct feedback as well as learning styles (auditory and kinesthetic), two specific educational programs were created. These programs are designed to incorporate direct feedback based on learning styles: (direct feedback according to auditory learning style) and (direct feedback according to kinesthetic learning style). Feedback is provided immediately after performing the exercises in the main section of the practical activity. Annex (9) shows the instructional unit for each of the experimental groups in the research sample.

3-9-2 Time Plan for the Educational Programs: The educational program is divided across the three research groups. The first experimental group used (direct feedback according to the auditory learning style), and the second experimental group used (direct feedback according to the kinesthetic learning style). The program consists of eight instructional units, with each unit lasting 90 minutes. Figure (1) illustrates this.

The Educational Program for the Experimental Groups:

Introduction (5 minutes):

- **Preparatory Section (25 minutes):**
 - General Warm-up (8 minutes)
 - Specific Warm-up (12 minutes)
 - Educational Part (10 minutes)
- **Main Section (60 minutes):**
 - Practical Part (50 minutes) with direct feedback according to the auditory and kinesthetic learning styles
- **Closing Section (5 minutes)**

This program is designed to focus on direct feedback and applies the respective learning styles (auditory and kinesthetic) during the practical segment of the main section.

It is noticeable that the three sections, their parts, and times are identical in all educational programs. Two introductory units were given, followed using a method for acquiring the technical performance of the long jump through the educational units. These units combine the advantages of both the holistic and part-method approaches. In this approach, the skill is first presented in its entirety, then performed by the students. After that, the skill is broken down into larger units (the technical phases of the long jump), and then the skill is divided into smaller parts. These parts are practiced individually and then linked together. Afterward, the

¹⁸ Murad Ahmed Yass Saleh; previously mentioned source, (2009) p. 194.

¹⁸¹⁸ Murad Ahmed Yass Saleh Al-Jubouri; The Use of Mental Training Accompanied by the Sequential and Random Method in Learning Technical Performance, Achievement Level, and Retention in the Long Jump Event, University of Mosul, (2015), p. 197.

¹⁸ Ali Abdul Aleem Mohammed Saber Al-Naqeeb; Previously Mentioned Source (2017), pp. 98-99.



phase is performed as a whole, and the process moves on to the second phase, where the parts of this phase are practiced and then linked together holistically. This pattern continues until the skill is practiced fully. This is illustrated in the model for the educational units for the two experimental groups as shown in Appendix (2).

3-10 Exploratory Experiments:

The exploratory experiment "is a preliminary experimental study conducted by the researcher on a small sample before conducting the main research, with the aim of selecting the research methods and tools."²¹

The researcher, along with the subject instructor and the assistant work team, conducted exploratory experiments for the three educational programs on twelve students from outside the study sample, but from the same research population. This was done to obtain accurate results before implementing the educational program in the main experiment, which was preceded by filming the technical performance of the long jump activity.

3-10-1 First Exploratory Experiment for Filming the Technical Performance of the Long Jump:

The researchers, with the help of the assistant work team, carried out the experiment to control the factors that could affect the filming of the technical performance of the long jump, with the presence of the supervising professor. This took place on Monday, December 17, 2023, at 8:30 AM. The purpose was as follows:

1. To determine the distance, height, and angle of the camera (Sony) and its location to avoid errors when performing the pre-test and post-test.

3-10-2 Second Exploratory Experiment:

Conducted on Tuesday, December 17, 2023, at 8:30 AM, applying the educational program for using direct feedback according to the auditory learning style.

3-10-3 Third Exploratory Experiment:

Held on Tuesday, December 18, 2023, at 10:30 AM, applying the educational program for using direct feedback according to the kinesthetic learning style.

The aim of the exploratory experiments for the educational programs was to:

1. Assess the appropriateness of the time for the educational unit and its sections.
2. Evaluate the students' responses to the sections of the educational programs.
3. Assess the suitability of direct feedback according to the auditory and kinesthetic learning styles in the educational unit.
4. Evaluate the appropriateness of exercise time and repetitions in the educational unit.

²¹ Abdel Hamid Kamal and Mohamed Sobhi Hassanien; Physical Fitness and Its Components: Theoretical Foundations – Physical Preparation – Measurement Methods, 3rd edition, (Cairo, Dar Al-Fikr Al-Arabi, 1997), p. 204.



5. Identify potential errors in execution.

3-11 Pre-test, Main Experiment, and Post-test:

3-11-1 Pre-tests:

The pre-tests were conducted on Wednesday, December 19, 2023, for the three research groups with the help of the assistant team²². Before starting the pre-test, the researcher provided a brief explanation and then presented the technical stages of the long jump activity. Each student then performed two trial attempts to get familiar with the long jump activity. The pre-tests consisted of three attempts per student according to the international amateur athletics rules. The distance from the take-off board to the start of the sandpit was not less than 1 meter. Performance filming for each attempt was done using a Sony video camera.

3-11-2 Main Experiment:

The educational programs for the three research groups were applied starting Tuesday, December 20, 2023. Two educational units per week were given to each experimental group, as well as to the control group. The researcher implemented the technical performance acquisition program for the long jump activity for all three groups on the sports and school activity field. The program specific to each experimental group was applied, which included the educational goals. Each educational unit contained direct feedback according to the auditory and kinesthetic learning styles, given after performing exercises for the applied section. All educational units were conducted on the sports and school activity field, distributed according to the weekly schedule for Monday and Wednesday of each week. This included:

1. The first experimental group, which applied direct feedback according to the auditory learning style.
2. The second experimental group, which applied direct feedback according to the kinesthetic learning style.
3. The control group, which applied the pre-prepared program.

The educational units for the research groups were completed on Wednesday, February 1, 2024.

3-11-3 Post-tests:

The post-test for acquiring the technical performance of the long jump activity for the three research groups started on Thursday, February 5, 2024. Each student was given three attempts, and the performance for each attempt was filmed in the same manner as the pre-test. The technical performance of the long jump activity was evaluated for the research sample through scientific observation using the video presentation to the scientific evaluators at the University of Kirkuk on Sunday, February 10, 2024. The researcher performed a simple correlation between the evaluators' scores for the best attempt, resulting in a correlation coefficient of 0.948, which is statistically significant, indicating objective evaluation between the evaluators.

²² Wadi Gharbi Saleh / PhD Student - College of Physical Education and Sports Sciences - University of Kirkuk.

Abdul Latif Maher Ahmed / master's Student - College of Physical Education and Sports Sciences - University of Kirkuk.

Qutaiba Sweid Jassem / master's Student - College of Physical Education and Sports Sciences - University of Kirkuk.

Marwan Ahmed Hassan / bachelor's Student - College of Physical Education and Sports Sciences - University of Kirkuk.



3-12 Statistical Methods:
The researcher used:

1. Data analysis was conducted using the Statistical Analysis System (SPSS), except for the percentage.
2. Arithmetic mean.
3. Standard deviation.
4. Pearson's correlation coefficient.
5. Percentage.
6. T-test for dependent and independent means.
7. One-way analysis of variance (ANOVA).²³
8. Least Significant Difference (L.S.D.) test.
9. Presentation of Results and Discussion

4-1 Presentation of Results:

4-1-1 Presentation of the results of the differences between the pre-test and post-test in acquiring the technical performance of the long jump for the three research groups:

After the researcher obtained the data, they were processed statistically using the paired T-test to determine the differences between the arithmetic means of the pre-test and post-test for the three research groups in acquiring the technical performance of the long jump.

Groups	Feedback Based on Learning Styles and Method Used	Unit of Measurement	Pre-test	Post-test	Calculated T-value	Sig Value	Significance of Differences
M1 (Used the regular program)	Degree	41.435 ± 2.867	60.000 ± 2.145	20.297	0.000	Significant	Significant
M2 (Feedback based on auditory learning style)	Degree	40.683 ± 2.234	67.400 ± 2.401	18.319	0.000	Significant	Significant
M3 (Feedback based on kinesthetic)	Degree	41.144 ± 2.465	77.900 ± 1.740	26.882	0.000	Significant	Significant

²³ Salahuddin Hussein Al-Heiti; Statistical Methods in Administrative Sciences (Applications Using SPSS): (Amman, Jordan, Dar Wael for Printing and Publishing, 2004), p. 397.



learning style)							
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4-1-1-1 Discussion of the Differences between the Pre-test and Post-test Results in Acquiring Technical Performance for the Long Jump Activity in the Three Research Groups:

From Table (8), it is evident that there are significant differences between the means of the pre-test and post-test for the three research groups in acquiring technical performance, with the post-test showing better results. This confirms the first part of the first hypothesis of the research. The Sig values for the three groups were 0.000, which is smaller than the error rate (0.05).

The researcher attributes the results of the control group to the impact of the instructional units and the time spent implementing their respective program, in addition to the content of each instructional unit, such as exercises and other requirements of the instructional unit, whether they are work periods (exercise repetitions), rest periods, or transitional periods between exercises or when moving from one exercise to another.

The researcher also attributes the post-test results to the effect of the instructional units, which include exercises, as well as the number of instructional units. Additionally, the independent variable—using direct feedback according to learning styles (auditory and kinesthetic)—had a positive effect on acquiring the technical performance of the long jump activity, and this reached a significant level for the two experimental research groups. "The process of learning a skill cannot be achieved by just the motivation to learn it, but it must be practiced and repeated over and over until the learner controls their movements and performs them correctly."²⁴

The study (Hussein & Hasan) (Majed) notes that the educational system from which cognitive training originates considers the learner's thought processes and cognitive operations in the learning process as the first experimental stage, which is limited (12:20). The progress level of any learner and their success depend on how well they master motor skills. This can be achieved by following the correct scientific approach in teaching methods and techniques.²⁵ This helped the individuals in the sample of both experimental groups to acquire technical performance in the long jump event. The researcher, while pointing to the positive results, also mentions that despite the closeness of the results, there is a difference between the two experimental groups in their means, which can be attributed to the advantage of using direct feedback according to learning patterns (auditory and kinesthetic) and the motivation found within the research sample. The direct feedback helps provide information about the progress being made toward achieving the desired goals, which aids in assessing performance validity and identifying aspects of the work that require additional effort according to the known steps.

4-1-2 Presentation of Results for Differences in Post-Test Between the Three Research Groups in Acquiring Technical Performance in the Long Jump Event: The data was statistically analyzed using the

²⁴ Najah Mahdi Shalash and Akram Mohammed Sobhi Mahmoud; Motor Learning, 2nd edition: (University of Mosul, Dar Al-Kutub for Printing and Publishing, 2000), p. 129.

²⁵ Hlal Abdul-Razzaq Shawkat, et al.; Technical and Tactical Preparation in Tennis (University of Mosul, Dar Al-Kutub for Printing and Publishing, 1991), p. 45.



complete random design method to understand the nature of the differences between the three research groups. The data analysis yielded the following:

Variables	Sum of Squares	Degrees of Freedom	Mean Squares	Calculated F Value	F	Sig	Significance of Differences
Between Groups	695.400	2	347.700	90.880		0.000	Significant
Within Groups	103.300	27	3.826				

Since the Analysis of Variance (ANOVA) test did not indicate any significant differences between the groups, the researcher resorted to using the Least Significant Difference (L.S.D) test to compare the mean scores of the three research groups in the post-test for the technical performance of the long jump, as shown in the table.

No.	Comparison Between Groups	Difference of Means (S)	Sig Value	Difference in Favor of
1	Group 1 - Group 2	60.000 - 67.400 = 7.400	0.004	Significant in favor of Group 2
2	Group 1 - Group 3	60.000 - 77.900 = 17.900*	0.000	Significant in favor of Group 3
3	Group 2 - Group 3	67.400 - 77.900 = 10.500*	0.000	Significant in favor of Group 3

The Sig value is considered significant when the error margin is less than (0.05), and the asterisk (*) indicates that the difference is significant in favor of the group with the higher mean.

4-1-2-1 Discussion of Results of Post-Test Differences Between the Three Research Groups in Learning the Technical Performance of the Long Jump:

From Table (10), there are significant differences between some groups and non-significant differences between other groups in acquiring the technical performance of the long jump. A significant difference was found between the control group, which used the existing program, and the second group, which used direct feedback according to auditory preference in acquiring technical performance. This is reflected in the fact that the mean of the control group was lower than that of the second group, thus confirming the second hypothesis of the research. The researcher attributes this to the teacher's attention to the sensory preference of the learner, which enhances their performance, as evidenced by the results and the interaction of the sample members with the learning environment.

There is also a significant difference between the third experimental group, which used direct feedback according to the motor learning style, in acquiring the technical performance compared to the control group, which used the existing program, and the second experimental group, which used auditory feedback. The third experimental group showed a higher mean, thus confirming the second hypothesis of the research. In conclusion, the third experimental group was the most effective group in acquiring the technical performance of the long jump.

The researcher attributes the superiority of the third experimental group in technical performance to the implementation of the educational program that included direct feedback according to the motor learning style.



This program contained exercises for each instructional unit, with exercises and repetitions standardized across all three research groups for teaching the long jump and mastering its technical stages. The use of direct feedback according to motor learning styles had a significant impact on improving the students' performance in the long jump, positively influencing their skill levels.

Additionally, watching performance models of the activity, reading the technical description, and the ability to visualize and focus attention on the complete technical stages of the activity contributed to this improvement. It is a common misconception that visualization relies solely on the sense of sight, and although it is true that sight plays a significant role in the visualization process.²⁶

It is evident from the previous discussion that the educational program implemented by the third experimental group, which included *direct feedback according to the motor learning style*, was the most effective program that achieved positive results in the post-test for acquiring technical performance in the long jump activity. *Wajeeh Mahjoub* stated that motor sensation must be relied upon to achieve optimal athletic movement performance.²⁷

Learning any motor skill is more difficult than learning a cognitive subject, but the benefit is that the motor skill is more easily retained in memory and is less prone to being forgotten. Therefore, motor memory is the strongest form of memory, followed by visual memory, and then auditory memory²⁸. The learner can adjust their motor performance through internal sensations derived from their sensory-motor nervous system.²⁹

5-1 Conclusions:

1. There is a positive effect of the educational programs implemented by the two experimental groups, which used direct feedback according to auditory and motor learning patterns, in acquiring the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences, University of Kirkuk, in addition to the positive results of the control group.
2. The third experimental group, which used direct feedback according to the motor learning pattern, showed clear superiority in the post-test compared to the two other experimental and control groups.
3. The experimental group that used direct feedback according to the auditory learning pattern excelled in the post-test over the control group.

5-2 Recommendations:

1. The educational programs created by the researcher, which used direct feedback according to auditory and motor learning patterns, can be utilized for acquiring the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences.

²⁶ Mohammad Al-Arabi Shammoun; *Mental Training in Sports*, 2nd ed. (Cairo, Dar Al-Fikr Al-Arabi, 2001), p. 133.

²⁷ Wajeeh Mahjoub; *Learning and Scheduling in Sports Training*, 1st ed. (Amman, Jordan, Dar Wael for Publishing, 2001), p. 75.

²⁸ Ya'arib Khayoun; *Motor Learning: Between Principle and Application*, 2nd edition: (Baghdad, Dar Al-Kutub, 2010), p. 16.

²⁹ Talhah Hossam El-Din et al.; *Motor Learning and Control*: (Cairo, Al-Kitab Publishing Center, 2000), p. 84.



2. It is important to focus on and emphasize the use of direct feedback according to the motor learning pattern in learning the technical performance of the long jump for first-year students at the College of Physical Education and Sports Sciences, University of Kirkuk.
3. Direct feedback should be re-used, with varying periods of implementation and its location based on learning patterns, on other samples and for different activities.

First: Arabic Sources:

- The Holy Quran
- Ibrahim Al-Feki; *Neuro-Linguistic Programming and the Art of Unlimited Communication*, 2nd ed. (Syria, Dar Al-Raya for Publishing and Distribution, 2009)
- Ahmed Abu Al-Ala Abdul Fattah and Mohamed Sobhi Hassanain; *Physiology and Morphology of Athletes and Measurement Methods for Evaluation*, 1st ed. (Dar Al-Fikr Al-Arabi, 1997).
- Osama Kamel Rateb; *Sports Psychology - Concepts and Applications*, 4th ed. (Cairo, Dar Al-Fikr Al-Arabi, 2007)
- Haider Faiq Al-Shama'a and Asil Jaleel Kaath; *International Law for Competitions* (2019)
- Diepold Van Dalen; *Research Methods in Education and Psychology*, (translated) Mohamed Nabil Nofal and others, 3rd ed. (Cairo, Anglo-Egyptian Library, 1984)
- Sobhi Ahmed Qublan and Nidal Ahmed Al-Ghafri; *Sports for All*, 1st ed. (Amman, Dar Al-Mujtama'a Al-Arabi for Publishing, 2003)
- Salah Al-Din Hussein Al-Hayti; *Statistical Methods in Administrative Sciences (Applications Using SPSS)*: (Amman, Dar Wael for Printing and Publishing, 2004)
- Talha Hossam Al-Din and others; *Motor Learning and Control*: (Cairo, Center for Book Printing and Publishing, 2000)
- Abdel Hamid Kamal and Mohamed Sobhi Hassanain; *Physical Fitness and Its Components, Theoretical Foundations – Physical Preparation – Measurement Methods*, 3rd ed. (Cairo, Dar Al-Fikr Al-Arabi, 1997)
- Abdel Sattar Jabar Al-Damad; *Physiology of Mental Processes in Sports – Analysis – Training – Measurement*: (Amman, Dar Al-Fikr for Printing, Publishing, and Distribution, 2000)
- Ali Abdul Aalim Mohamed Saber Al-Naqib; *The Effect of Skill-Based Exercises Using the Distributed Practice Scheduling Method According to Sensory Preference Systems on the Motor Performance of Some Indoor Football Skills – Female Students*, 2017
- Mohamed Ibrahim Mohamed; *Learning Patterns and Their Role in Teaching Youth*: (For Youth Center for Studies and Research, no date)
- Mohamed Al-Arabi Shamoun; *Mental Training in the Sports Field*, 2nd ed. (Cairo, Dar Al-Fikr Al-Arabi, 2001)
- Mohamed Osman Abdel Ghani; *Motor Learning and Coaching Science*, 2nd ed. (Kuwait, Dar Al-Qalam, 1987)
- Murad Ahmed Yas Saleh; *The Effect of Different Mental Training Methods in Learning Technical Performance and Achievement Level in Shot Put*, Unpublished Master's Thesis, College of Physical Education, University of Mosul (2009)
- Murad Ahmed Yas Saleh Al-Jubouri; *Using Mental Training with the Sequential and Random Methods in Learning Technical Performance, Achievement Level, and Retention in the Long Jump*, University of Mosul (2015)



- Wagih Mahgoub; *Learning Theories and Motor Development*: (Amman, Dar Al-Nashr for Printing, 2001)
- Wagih Mahgoub; *Learning and Scheduling Sports Training*, 1st ed. (Amman, Dar Wael for Publishing, 2001)
- Wissam Salah Abdul Hussein, and others; *Learning Patterns and Their Applications*, 1st ed. (Iraq, Dar Al-Ma'arif Cultural Foundation, 2018)
- Yiarab Khayoun; *Motor Learning Between Principle and Application*, Office: (Baghdad, Al-Sakhra for Printing, 2002)

Second: Foreign Sources:

- Majed, S. S. (2022). *The effectiveness of the six thinking hats strategy in testing the cognitive achievement of handball basic skills*. SPORT TK-Revista EuroAmericana de Ciencias del Deporte, 20-20. <https://revistas.um.es/sportk/article/view/522031>
- Hussein, A., Majed, S., & Hasan, U. (2023). *Effect of employing the knowledge economy using the problem-solving strategy on the learning of basic tennis skills*. SPORT TK-Revista EuroAmericana de Ciencias del Deporte, 12, 3. <https://doi.org/10.6018/sportk.545921>

Appendix (1): Names of Experts and Specialists

No.	Expert's Name	Specialized Field	Workplace
1	Prof. Dr. Kamel About Hussein	Psychology / Track and Field	College of Physical Education and Sports Sciences / University of Diyala
2	Prof. Dr. Thaer Ghanem Mulla Alu	Biomechanics / Track and Field	College of Basic Education, Department of Physical Education and Sports Sciences / University of Mosul
3	Prof. Dr. Noufal Fadel Rashed	Motor Learning / Racket Sports	College of Physical Education and Sports Sciences / University of Sulaymaniyah
4	Prof. Dr. Mohib Hamid Rija	Motor Learning	College of Physical Education and Sports Sciences / University of Tikrit
5	Assist. Prof. Dr. Mateen Suleiman Saleh	Motor Learning	College of Physical Education and Sports Sciences / University of Kirkuk
6	Assist. Prof. Dr. Amina Karim Hassan	Teaching Methods	College of Physical Education and Sports Sciences / University of Kirkuk
7	Assist. Prof. Dr. Ihsan Qadouri Ameen	Motor Learning / Track and Field	College of Physical Education and Sports Sciences / University of Kirkuk
8	Assist. Prof. Dr. Wiam Amer Abdullah	Tests and Measurements	College of Physical Education and Sports Sciences / University of Kirkuk
9	Assist. Prof. Dr. Saadallah Saeed Majid	Teaching Methods	College of Physical Education and Sports Sciences / University of Kirkuk

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]	Total time	Activity	Time	Motor Activity or Skill	Notes
Preparatory Section	25 min	Introduction General warm-up Special Warm-Up	5 min 10 m 10 m	<p>(Standing) Normal walking - Jogging - Light jogging with arm rotations (high and low, backward) - Light jogging with arm movement (front, side, back) - Jogging with alternating knee lifts, then heel raises towards the hips - Light jogging - Walking on toes + Standing, then rotating the ankle, knees, and hips, followed by walking.</p> <p>Stretching exercises for all body parts.</p> <p>(Standing) Jumping jacks with legs opening and closing.</p> <p>(Standing, with legs apart) Alternating heel lifts towards the hips.</p> <p>(Standing) Jumping in multiple directions: forward, backward, left, right.</p> <ul style="list-style-type: none"> (Standing, with legs apart) Rotating the ball around the body and between the legs in a figure-eight pattern. 	<p>Emphasis on forming an organized pattern.</p> <p>Vary the type of exercise according to the cues provided during the warm-up.</p> <p>Repeat the exercise nineteen times.</p> <p>Ensure the warm-up serves the effectiveness of the activity.</p> <p>Perform the exercise using a 3 kg medicine ball.</p>
Section	Total time	Activity	Time	Motor Activity or Skill	Notes



<p>Main Section</p>	<p>60 min</p>	<p>Educational Section</p>	<p>(10)</p>	<p>1) A. The teacher will explain the legal aspects of the long jump event. B. The teacher will give an idea about the long jump and demonstrate the movement pattern for the steps (approach run, takeoff, flight, landing). 2) A. The movement pattern for the phases (approach run, takeoff, flight, landing) will be demonstrated by the students as follows: 3) Perform the movement pattern for the phases (approach run, takeoff, flight, landing) by walking on the grass.</p>	<ul style="list-style-type: none"> • Focus attention on the legal aspects of the event. • Pay attention to performing the movement pattern for the phases. • Ensure appropriate distances during performance. • The exercise should be repeated nineteen times. • Emphasize correct and serious performance of the steps and repeat the exercise nineteen times. • Repeat the exercise nineteen times. • Correctly apply the exercise and repeat it nineteen times. • Ensure direct feedback by adhering to the teacher's instructions and correcting mistakes.
<p>Cool-down Section</p>	<p>5 min</p>	<p>Application Section</p>	<p>50)</p>	<p>4) Perform the movement pattern for the phases (approach run, takeoff, flight, landing) by jogging on the grass. 5) Perform the movement pattern for the phases (approach run, takeoff, flight, landing) by jogging and landing in the sandpit.</p>	



				<ol style="list-style-type: none">6) Exercise: hopping (right) while walking on the grass.7) Exercise: hopping (left) while walking on the grass.8) Exercise: ten steps followed by hopping (right) on the grass.9) Exercise: ten steps followed by hopping (left) on the grass.10) Integrated exercise (approach run, takeoff, flight, landing) performed while jogging on the track.11) A small competition game (running in the form of jumping for twenty meters).12) Cool down and breathing.13) Chanting the dismissal slogan (Sport: Activity).	
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