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The effect of using a feedback device in teaching a skill such as standing on the hands and switching a half turn outward on the parallel bar

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Abstract:
Two general trainers in the sports field do not disagree about finding and using a special aid in teaching skills, as each sports skill has a specificity in learning it, and the game of artistic gymnastics for men is one of the individual games and has physical, movement and coordination requirements. **The aim of the research** is to know the effect of using The feedback device in teaching the skill of standing on the hands, alternating a half-turn outward on the parallel apparatus. **The research hypothesis** is that the use of an instantaneous feedback device has an effect in teaching the skill of standing on the hands, alternating a half-turn outward on the parallel apparatus. **The researcher used the experimental method** with a sample design. One because it suits the research problem, **as the research population** is limited to (7) emerging players who train in Baghdad, Al-Amana Sports Club for Gymnastics, and their ages range between (9-13) years. As for the research sample, they are (6) players, and the research sample constituted (90%). **As for the most important conclusions**, the assistive device added to the sample a second and enjoyable training method that had a clear impact on learning the skill of standing on the hands, switching half a turn to the outside. Through the educational units and repetitions for the players on the device, it becomes clear that it has a good design and can withstand their weights and repetitions. **The researcher suggests** that During the course of working on some skills similar to the skill under

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research, conducting studies on the use of an assistive device in learning them, in which the handstand skill enters the elementary part, such as the skill of hilly and switching half a turn inwards, which have greater difficulties in learning.
Keywords: auxiliary device, parallel, switching skill

Introduction

There is no difference between coaches in the sports field in finding and using a special aid in teaching skills, as each sports skill has a specificity in learning it in some sports, as its skills are played with the feet, others are played with the hands, and others use the body in general. The successful coach is the one who uses all available capabilities in the learning process and conveys the method of performance easily and with all its technical requirements.

Men's artistic gymnastics is an individual game that requires physical, motor and coordination skills, and its general skills must have a strong foundation based on learning its basic skills, as these skills are classified according to difficulty from difficulty (A) to difficulty (T), and it is difficult for the player to perform a higher difficulty without mastering the lower difficulty on all six gymnastics devices.

The parallel bars device according to the competition classification is the fifth sequence, and the player relies mainly on the arms and the strength of the hand grip. In all his skills, no part of the player's body may touch the parallel bars or the body of the parallel bars. Feedback in learning the skills of the parallel bars plays a major role in this process. (Ahmed Fadhil Farhan Mohammed Jawad Kadhim, 2016) Learning in transitions is instantaneous and changing direction is essential in performance, so the player must use the entire length of the apparatus and cannot complete ten skills in one direction. The problem of the research lies in the process of moving from one beam to another and changing direction. The player's balance is very unstable, which leads to falling in the transition process, especially in the process of standing on the hands, as other than this position, the player cannot change the direction of his body. (Kadhim, 2023) The simplest process of changing direction from one direction to another is standing on the hands, changing direction. There is a process of changing direction with highly difficult skills, the simplest of which is standing on the hands. The importance of the study lies in using the instantaneous feedback device in teaching the skill of standing on the hands, changing direction in gymnastics on the parallel bars in artistic gymnastics. Many studies have addressed the topic of assistive devices and feedback in solving many problems, including the study (Sabah et al., 2016), where the researcher concluded that it is necessary for the teacher to use (feedback) when teaching any motor skill, as it helps expand the learner's awareness, which facilitates the learner's learning process and develops his motor performance. (Easa et al., 2022) As for the study

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(Shawkat, 2021), the researcher concluded that the experimental group achieved better positive learning of the front jump skill on the jumping table than the control group. As for the study (Al-Samri et al., 2015) and the study (Karim et al., 2022), the researchers concluded that using the learning cycle method according to the timing of feedback had a positive impact on learning the gymnastics skills under study and that the effectiveness of the learning cycle method according to immediate feedback in learning the skills of open front roll and standing on hands and maintaining them. (jawad kadhim, M., & Mahmood, 2023) As for the study (Mohsen and Majeed 2020), the researchers concluded that the proposed instant feedback device is useful in teaching the skill of aerial backflips, as the experimental group outperformed the control group.

Research objective:

To know the effect of using the innovative feedback device in teaching the skill of standing on the hands and turning half a turn outward on the parallel

Research hypothesis:

Does using the innovative feedback device have an effect in teaching the skill of standing on the hands and turning half a turn outward on the parallel

Method and tools:

The researcher used the experimental method with a single sample design to suit the research problem, where the research community was determined by (7) young players training at the Baghdad Al-Amanah Sports Club for Gymnastics, and their ages ranged between (9-13) years, while the research sample amounted to (6) players, and the research sample constituted (90%).

Table (1)

shows the percentages of the sample distribution

T	the society	the number	Percentage
1	research community	7	100%
2	The research sample	6	85%

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3	**Exploratory sample**	**1**	**14%**

The researcher used research methods (Arabic sources and references, observation and analysis, tests and measurement, the Internet), and the researcher also used tools and devices including a timing device, a camera, low legal scales, an assistant device, and foam mats.

How to design the device:

After studying the problem and what causes imbalance and the center of gravity of the body outside the performance area by relying on the crossbars while standing on the hands and to give the player a warning of this with feedback, it was necessary to design a device that keeps the player stable on the crossbars while standing on the hands without falling and returning again to the device. The researcher began by consulting gymnastics experts and coaches* (see Appendix 1) by placing an alert device when the legs go out of the skill's line of action to restore it and correct the body position before switching and falling from the device. Accordingly, the device was designed and its components are:

Components and specifications of the proposed device:

A- Main part

1- Base:

A- The base consists of iron in the shape of (rectangle) with a length of 1.5 meters, a height of 5 cm, a width of 50 cm, and a height of 5 cm. The researchers chose these measurements for the strength, durability, and balance of the device on the ground.

B- Iron supports, number (4), with a height of (30) cm to fix the parallel bars on the main base.

C- Two hollow iron rods (2) each 1 m long and (30) cm in diameter, representing the iron rod of the parallelogram

2- Side arms:

Consists of two square iron arms each 1.80 cm long, 4 cm wide and 4 cm high, one end of which is fixed to the base from below with a piece of iron fixed to the body of the base from below and the other end is free from above

3- Circular iron body:

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Consists of a piece of iron in the shape of a circle 2 m long, 4 cm wide and 2 cm high fixed from above to the other free end of the side arms horizontally to the base and directly above the parallelogram rods, and consists of a variable height according to the educational program for young players

4- Electronic device:

It is a simple electrical circuit consisting of a 12-volt battery and an audible alarm device that connects the electronic device to the player's abdomen with a rubber belt and the wires from the device are fixed to the upper part of the body. (Kadhim, 2023) The player's feet when the iron body is touched by the feet, the wires direct the electronic circuit, which gives an alert that generates an audio signal that the body has gone out of the skill's line of action or its path, which serves the player to correct his

position on the device directly, (Mahmood et al., 2023) as shown in the following figure.

Figure(1)

shows the work on the device

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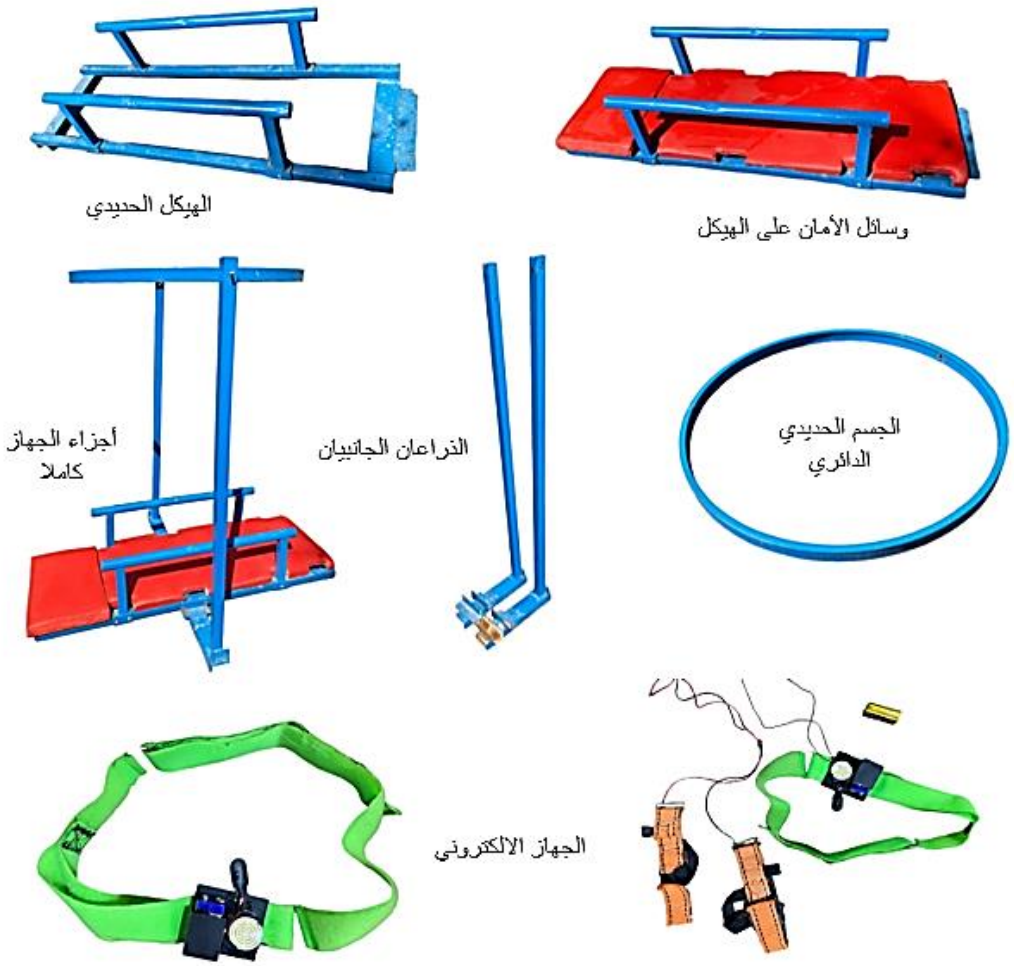

Figure(2)

Shows the complete parts of the device

The researcher, with the help of the assistant work team (see Appendix 2), conducted a pilot experiment to determine the efficiency of the device. The pilot experiment was conducted in the Rusafa side of the Amanat Club Hall on one player from outside the research sample in order to initially test the operation of the device on the players and also to find out whether the device was suitable for implementing the curriculum on it and its design and parts had not changed.

Pre-test for the skill of standing on the hands and switching half a turn to the outside on the parallel

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Field research procedures:

1-4-2Skill tests

-1Test objective: measuring the ability to perform and knowing the final score that the player obtains for performing the skill of standing on the hands and switching half a turn (180) degrees

Test tools: low-height parallel, sponge mat with a height of (10) cm, watch.

Test evaluation: The test is evaluated according to the technical performance, as the highest score that the player obtains on the device is (10) degrees.

Testing procedures: The tester assumes a ready position, climbs onto the apparatus, stands on his hands and remains still for (2) seconds, then performs the switching skill by leaving the crossbar with the right arm and leaning on the second crossbar with the left arm, i.e. he turns at an angle of (90) degrees, then pushes with the left arm and turns at another angle of (90) degrees to lean on it with extended arms and remains still after the performance is completed. For recording: The evaluation is done directly by four judges (see Appendix 3) and according to a special evaluation agreed upon by the judges, and the average of the two scores is taken and divided by (2) for the purpose of extracting the final score for the player, (Al-Ali & Abdulzahra, 2024)and the performance evaluation is out of (10) scores as shown in the following figure.

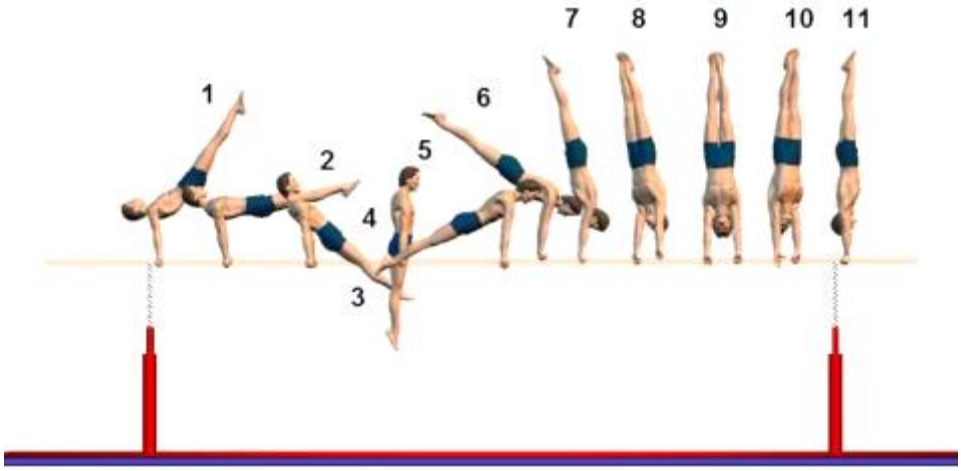

Figure (3) shows the skill performance

The researcher relied on the curriculum and vocabulary set by the trainers. As for the educational curriculum prepared by the researcher, he set it himself based on the consultation and experience of the game experts from the trainers (see Appendix No. 4). He did not change the specified vocabulary, and used the auxiliary device in the curriculum set for the sample. The experiment lasted for (6) weeks and included (12) educational units at a rate of (2) units per week. The total unit time was (145) minutes

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of the device time from the main part of the unit with a time period of (35) minutes for the parallel device. He also applied the principle of (repetitions) in each educational unit, and he was keen that the educational curriculum that he and the trainer set was in accordance with scientific foundations and principles.

Table (2)

shows the experimental design of the research group

Posttest	Pilot program	Pretest	the group
Testing the skill of performing a handstand, exchanging a half turn to the outside	Using the device	Testing the skill of performing a handstand, exchanging a half turn to the outside	Research group

After completing the components of the curriculum to apply the skill of standing on hands and switching half a turn outward on parallel bars, (Salih, I. H., Yaseen, A. M., Naseer, K. J., Attieh, A., & Kadhim, 2024) the post-test was conducted at the same time and in the same manner as the pre-test procedures, as the researcher prepared the atmosphere and conditions in which the pre-tests were conducted, and as shown in the skill test to evaluate the players,(Sakran & Shehab, 2023) they were evaluated directly by the judges (Appendix 3) approved by the Central Gymnastics Federation, and the evaluation score was based on a range of (10) skill points, and the researchers adopted the arithmetic mean of the judges' average scores, and divided it into two parts to extract the final score for the player.

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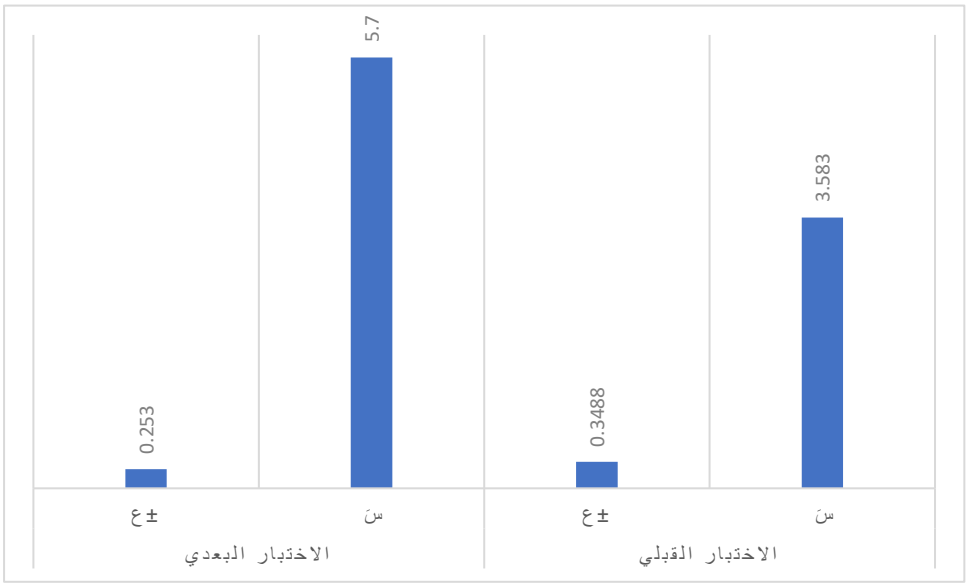
Results

Table(3)

shows the arithmetic mean, standard deviation, calculated (t) value, error level, significance, differences in arithmetic means, and deviation of differences in the pre- and post-tests of the two skills in the research sample

	N	Measurement	Pretest		Post-test		F	A F	T value Calculated	themselves	Type of significance
			s	ع±	s	ع±					
Switch skill	**6**	**degree**	**3.583**	**.3488**	**5.700**	**.2530**	**2.116**	**.3656**	**14.181**	**.000**	**Dal**

* Significant at the confidence level (0.05) if the error rate ≤ (0.05). And the degree of freedom of n-1 = 5



(4) Figure

.shows the histogram of means and standard deviations in the pre- and post-t**ests**

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Discussion The results shown in Table (3) and Figure (4) for the two skills showed significant differences between the two tests in favor of the post-test. The researcher attributed this to the use of the (assistant) device that proved effective in teaching the skill of standing on hands and changing half a turn outward, by keeping the center of gravity of the body above one line of action with the shoulder and wrist joints, so that there is one line of action while moving from one crossbar to another, (HalahAtiyah et al., 2024) in addition to keeping the legs above the parallel crossbar, which gives the player good balance while turning and moving from one crossbar to another. As for the role of the electronic device that contributed to giving an alert when the body touches the circular iron ring and immediate feedback to quickly correct the body position, the results showed a development between the pre- and post-tests in favor of the post-test by developing the arithmetic averages of the two tests. (Jawad Kadhim & Mousa, 2024)This indicates the contribution of the device (assistant) designed for the teaching process effectively and the extent to which the coach and players benefited from the proposed device, which contributed well to teaching players through performance free of errors associated with learning. Also, (Salih, I. H., Yaseen, A. M., Naseer, K. J., Attieh, A., & Kadhim, 2024)“feedback is corrective information that reaches the brain and its goal is to correct errors and refine performance to achieve full implementation of the motor duty. It comes from different sources, some of which are external, such as the correction process by the coach or teacher or others, and some of which are internal and include information coming from organs in the human body, such as the Golgi and Catenius bodies, etc., which send sensations to the brain during motor performance” (Sameer, Ahmed, 2007, p. 113). This was also confirmed (Abdulhussein et al., 2024)that devices and tools help in transferring knowledge, information and various and multiple skills and increase the ability of players to acquire skills through different senses and thus work to positively influence the speed of developing basic skills and improving the specifications of tactical and skill performance. (Al-Karimi, 2019, p. 20) indicates that "assistive tools and devices play a major role in improving and developing technical performance and helping the player understand the movement path that the player goes through, (Salih et al., 2024) in addition to providing the necessary strength to complete the main part of the movement, in addition to being a good safety measure, (Mohsen et al., 2024)but there are some skills in which it is difficult to provide manual assistance due to the multiplicity of movement axes and the player's position in which it is difficult to give additional strength by the coach ".(Abdalah & SalehRadhiAmesh, 2024)

(Jassim et al., 2012, Volume 12, p. 39) indicates that feedback plays an effective role in learning motor skills and is one of the strongest variables controlling performance as performance cannot be improved without using it, and feedback has a comprehensive concept,(MANDOOBMAKKIATI & ABED, 2024) which is knowing the results and

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using this knowledge to improve performance. The device also added a second method for players.

The proposed device also contributed to developing the spirit of competition and excitement among young players through it and reaching the goal of teaching the skill under study, which is what it was developed for.
In addition, the repetitions used on the proposed device, the scientific method, the variety of exercises, and the number of educational units, which amounted to (2) units per week, these factors greatly helped in attracting players and attracting them towards learning and increasing their motivation,(Hammood et al., 2024) which contributed to developing the experimental group.

Conclusions

1- The auxiliary device added to the sample a second and enjoyable training method that clearly affected the learning of the skill of standing on hands and turning half a turn to the outside

2- Through the educational units and the players' repetitions on the device, it is clear that it has a good design and can bear their weights and repetitions,

3- The researcher suggests, through the work paths of some skills similar to the skill under study, conducting studies using the auxiliary device in learning them, where the skill of standing on hands is included in the initial part, such as the skill of hill and turning half a turn to the inside, which is more difficult to learn

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Appendix (1)

Gymnastics experts and coaches

T	the name	Specialization	Workplace
1	Prof. Dr. Jamal Sukran	History, gymnastics	University of Baghdad/College of Physical Education and Sports Sciences
2	M. M. Ali Saadi Mohsen	Education, gymnastics	University of Baghdad/College of Physical Education and Sports Sciences
3	M.M. Samer Raad Jassim	Training, gymnastics	Al-Farahidi College, Physical Education and Sports Sciences
4	M.M. Abdullah Jamal is drunk	Education, gymnastics	Eagles University/Physical Education and Sports Sciences

Appendix (2)
Assistant work team

T	the name	Adjective
1	Muhammad Gamal Tawfiq	Student/College of Physical Education and Sports Sciences
2	Abdul Khaleq Saeed	Student/College of Physical Education and Sports Sciences
3	Aws Reda Ahmed	Student/College of Physical Education and Sports Sciences

Appendix (3)
Names of arbitrators

T	the name	Arbitration certificate	Workplace
1	Mahmoud Saleh	First instance judge	Central Federation of Gymnastics
2	Hamed Awaid	First instance judge	Central Federation of Gymnastics
3	Samer Raad	First instance judge	Central Federation of Gymnastics
4	Good luck	First instance judge	Central Federation of Gymnastics

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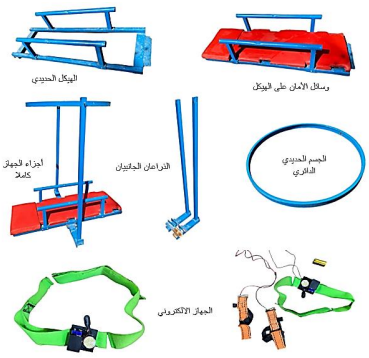
(4) Appendix
Model of the educational unit

Research group Unit time: (150) minutes
(6) :Objective: Teaching the stages of technical performance of the skill Number of group members
Location: Training hall, Al-Amanah Club

:Preparatory section: (30 minutes) divided into two parts
(10 minutes) General warm-up + (20 minutes) Special warm-up
Main section: (105 minutes)
Main section for parallel bars (35 minutes)
Final section: (15 minutes) includes cool-down

the week	Unit	the time		Differentials	the shape
The first week	The first Saturday	parallel	35 M	The first unit defines the performance of the switching skill completely and the most important points that positively and negatively affect the skill, with a detailed explanation of the assistive device used in the process of teaching the skill and each part of the device to serve the paths of the skill and its auxiliary parts, as well as the method of wearing the electronic device and an explanation of its operation.	
	Second Tuesday	parallel	35 M	Without wearing the electronic part, he stands on his hands inside the device, and the player begins by letting go of holding the bar, raising his hands, and re-holding the bar while opening his legs from the top and leaning on the circular iron hoop. The player repeats the exercise (5) times, then performs a handstand (2) seconds and descends from the device	

Repetitions are not allowed by the time of the educational unit*

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