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The effectiveness of using strength exercises with some aids to improve the level of physical fitness and the performance of the approaches and advancement stages in the effectiveness of pole vaulting

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Abstract

The sports field is one of the fields in the society that is concerned with the use of auxiliary tools, whose use has become an essential thing in the educational process, through their various uses in education and improving performance, in addition to their effective impact in developing the level of performance and achievement among students. Where the research aimed to prepare strength exercises using tools to assist in the effectiveness of pole vaulting for students and to know its impact on the level of performance. The research problem focused on the researcher's observation, while teaching the subject of athletics, especially the effectiveness of pole vaulting, the difficulty of mastering the performance of the technical stages by most students for this activity, because this activity contains complex and complex movements, which makes it difficult for students to perform for fear of injury, especially as it is performed using a tool (Stick) The pole, which weakens the performance. In addition, the weakness of some of their physical characteristics. The researcher assumed that there are significant differences in the physical tests. And there are statistically significant differences between the pre and post tests for the two experimental and control groups in the physical tests. And that there are statistically significant differences between the experimental and control groups in the post tests in favor of the experimental group.

Keywords: Technique - complex and compound movements - pole stick

Introduction

The educational world is living in the information age and the communications revolution at a time when it faces many problems and challenges. Many devices and tools have emerged that are trying to address the challenges facing education in various countries of the world, especially the third world countries, in which learners suffer from delays to keep pace with the problems of quantity and type of information, knowledge and skills. All this prompted the thinking to use the newly developed methods to carry out some teaching tasks that could lead to increasing the effectiveness of the educational process and reaching the level of better performance.

The means and tools in the sports field are of great importance because they have an effective and positive impact on the speed of learning and investment of effort, and that their adoption in teaching methods and methods qualifies students to practice sports and improve the level of performance. The importance of the tools in our research is shown by using strength exercises with auxiliary tools, as they contribute to the delivery and transfer of theoretical information and practical skills to the student to complete the lesson work in the educational aspect, in addition to raising the level of physical fitness, as well as "it uses the learner's arousal to perform appropriately and in the appropriate circumstances. We can call this Tools (means) we put in the field of the trainer or teacher. (Khiun: 2002. pg. 189).

Therefore, the use of auxiliary tools is one of the means of improving the level of fitness and performance of students, and then the result of effectiveness, especially by using strength exercises because it comes out through educational methods with traditional exercises. It removes the fear factor and hesitation from the performance. The fact that this event is characterized by a large number of harmonic movements in the parts of the body, whether in the arms, legs and head, and it is one of the most complex and most dangerous jumping activities in athletics because it uses a tool (stick) to cross the crossbar, unlike other activities, and it also requires high physical qualities that must be provided by jumpers Such as speed, strength, flexibility and agility, in addition to the availability of special types of jumping sticks and a jumping device that meet the conditions of safety. It also needs boldness and courage because it is considered one of the difficult activities, and the first of these difficulties is the performance of these

movements is limited to the extent of compatibility between the possibility of using the stick with running and then upgrading and jumping with it With the achievement of advanced kinetic conditions in difficulty after the process of upgrading, "therefore, the pole (the pole) represents the effective axis in the jumping process." (Mohammed Shalgami: 1999/. pg. 37).

Hence the importance of research in studying this event and finding the best means, methods and methods, including the use of strength exercises with appropriate auxiliary tools to improve the level of physical fitness and performance and develop effectiveness, and thus this will be reflected in the benefit that accrues to coaches of clubs and teams and physical education teachers in institutes and colleges, especially for athletics. Whereas AtheerSabri (2019) mentions that strength exercises using auxiliary tools are considered a complement to the modification and improvement of the athlete's technique continuously due to the elimination of technical errors and the strengthening of the weak stages of that performance, and this is after there is prior preparation from a physical point of view.

The research problem focused during the researcher's observation while teaching the subject. The difficulty of mastering the performance of the technical stages for most students, fear, hesitation, and unwillingness to apply, which caused the low level. The researcher attributes the reason for this, firstly, to the weakness of the physical aspect of the students, which makes it difficult for them to perform complex, complex and harmonic movements for this activity, in addition to the presence of the pole (stick) that requires compatibility between carrying the stick with running and providing an element of safety. In addition to the failure to provide auxiliary means and tools that carry the safety conditions included within the curriculum of the lesson material established by the college, so the researcher tried to use auxiliary tools as a factor of suspense and excitement to assimilate students and try to succeed and their desire to learn and perform effectively, which helps them to master movement and not be afraid of the difficulty of performance With the tool used (stick) the pole, thus raising and improving the level of performance and effectiveness Therefore, the researcher decided to study the effectiveness of using strength exercises with some tools to help improve the level of physical fitness and performance for the stages of approach and advancement in the

effectiveness of pole vaulting. Where the research aimed to prepare strength exercises using tools to assist in the effectiveness of pole vaulting for students and to know its impact on the level of performance of this event. Where the research sample consisted of students of the second stage/College of Physical Education and Sports Sciences/University of Baghdad for the academic season 2018/2019, numbering (12 students) out of a total of (65) students representing Division (A-B). Students and the control group (6), club and team players, the physically and medically injured, and the repeaters were excluded. Five students were selected for the pilot experiment.

The researcher assumed that there were statistically significant differences in the results of the pre and post tests for the experimental and control groups in the physical tests for the effectiveness of pole vaulting and in favor of the experimental group. The researcher added in the study (Jafar 2005) that the assistive device (pendulum) worked to develop students' levels of learning better than other means of mastering the skill of upgrading and weighting. In another study (Al-Amri and 2009), where it was concluded that the exercises with the auxiliary tools helped the jumpers know the technical stages of the effectiveness and provide a wide scope for how to link between the stages to correct the technical performance errors and stay away from them.

And in a study in the same regard (Kati' 2003), which concluded that the educational curriculum with auxiliary tools had a positive impact on developing running speed and performing 100m effectiveness.

Similar studies

- ✓ Study of SajitJaafarMajeed (2005).
- ✓ (The impact of the aids in teaching the stages of ascension and weighted pole vaulting)
- ✓ Study of AseelJalilKateh (2003).
- ✓ (The effect of using auxiliary tools in teaching and developing the level of performance and some special physical traits and the result of 100m)
- ✓ Study of Qasim Muhammad Hassan Al-Khaqani (2001).
- ✓ (Methods of rapid strength training and their impact on some biomechanical variables during the stage of advancement and achievement in high jump).
- ✓ Study of HaiderFayadhHamad Al-Amri (2009).

- ✓ (The effect of exercises using aids in developing technical performance and achievement for the effectiveness of pole vaulting for youth).
- ✓ Mona FathiSalloumi study (2000).
- ✓ (The effect of using some auxiliary tools on developing the level of performance for some basic skills in handball).
- ✓ Study of Muhammad Reda Ibrahim (1994).

(The effect of training different jumping exercises on improving the maximum strength and strength characteristic of speed).

Actions:

The researcher used the experimental method by designing the experimental and control groups with a pre and post test. As for the research sample, it consisted of students of the second stage / College of Physical Education and Sports Sciences / University of Baghdad for the academic season 2018-2019, which numbered (65) students. (12) students were selected and divided into two groups, the experimental group (6) students from two divisions (A - b) The sample was homogeneous and equal in the variables of height, age, weight and tests, as shown in Table (1)

Table (1) shows the equivalence and homogeneity between the experimental and control groups

The significance of the differences	**experimental group**		**control group**		**Statistical parameters** / **Variables**
	±A	-S	±A	-S	
insignificant	0,75	21,16	0,75	21,83	**age/year**
insignificant	5,11	69,83	4,32	70,5	**Weight/kg**
insignificant	0,10	1,70	0,74	1,68	**length/cm**
insignificant	0,82	5	1,29	5,5	**Run 50m from high start**
insignificant	0,15	1,33	0,13	1,29	**One leg fixed long jump/cm**
insignificant	3,47	33,2	3,13	32,5	**Vertical jump with both**

					feet/cm
insignificant	3,56	9,8	0,19	9	**bend the torso from sitting cm**
insignificant	2	14,69	0,15	13,21	**Hanging in the knees bent position/sec**
insignificant	1,87	17	1,80	16,65	**equilibrium on one foot metatarsal/sec**

Significant error rate (0.05) in front of the degree of freedom (6) and the value of T tabular is equal to.(1.94)

It is clear from Table (1) that the tabulated value of (T) is greater than the value of (T) calculated, which indicates that there are no significant differences between the control and experimental groups in the variables approved in equivalence and homogeneity, which indicates the equivalence and homogeneity of the two groups.

Exploration experience

The exploratory experiment was conducted on a sample of (5) students other than the original research sample to obtain reliable results and conditions on the athletics track at the College of Physical Education and Sports Sciences / University of Baghdad The candidate tests were conducted and included (50m running test - vertical jump test from stability - standing test on the instep - long jump test from stability with the rising foot - hanging from the knees bending position - the trunk bending down from standing test). The researcher used many sources, scientific research and experts in order to determine the most important physical tests for the effectiveness of pole vaulting in order to know their suitability for research. The most important tests were placed in a special questionnaire form prepared for this purpose and presented to experts and specialists in the field of athletics and training. After collecting and unloading data and arranging tests. The researcher took the tests nominated for the study by the experts, according to the percentages of agreement, as shown in Table (2).

Table (2)shows the percentage of physical tests nominated by experts for the effectiveness of pole vaulting

Percentage %	Measuring unit	The purpose of the test	Test name	No
%85	Sec	speed measurement (acceleration)	Run 50m from high start	**1**
%84	cm	The speed characteristic of the legs	vertical jump from stability	**2**
%95	sec	balance measurement	Stand on the instep of one foot	**3**
%89	m	Measurement of the explosive power of the legs	The long jump from stability with the feet of elevation	**4**
%75	sec	Measure the endurance of the arms and shoulder girdle	Hanging from a bent knee position	**5**
%87	cm	torso flexibility measurement	Bend the torso down from sitting	**6**

• Running test from higher start. (Hasnain, 2006, p. 292).

• Vertical jump test from stability. (Summon, 2014, p. 262).

• One-foot metatarsal standing test. (Virtual Library, 2018)

• The long jump test of stability with the foot of the rise. (Al-Fadhli, 2010, p. 93).

• The test of attachment from the position of bending the knees. (Virtual Library, 2018).

• The torso flexion test from sitting. (Jawad, 2014, p. 118).

Tribal tests:

The tribal tests of the research sample were conducted on the athletics track in the College of Physical Education and Sports Sciences / University of Baghdad. After preparing the supplies for the names of the sample and the test and measurement tools, the first day of the tests included [50m running test from the high start - the vertical jump test from stability - the test of standing on the instep test]. Hanging from a bent-knee position - the torso flexion test from standing.Where the test was conducted on the two

experimental research groups, which numbered (6) students, and the control group, which numbered (6) students.

The main experience of the research sample

The exercises were applied according to the results of the exploratory experiment of the research sample. The researcher has adopted the modern scientific elements. And the opinions of the specialized experts, as I tried to use some auxiliary tools as an interesting factor to assimilate the students to the stages of performance, after they were backed by scientific references and personal interviews of experts in athletics competitions to allow the opportunity to present the training curriculum for strength exercises with tools for this event. Helps to improve and better performance of students Appendix (1). Where the exercises were applied to the experimental group, while the control group continued to implement the lesson curriculum decided and specified by the college for this subject.

The duration of the experiment was only four weeks. This is because the curriculum for the second stage is lengthy. As the experiment was carried out by two training units according to the established schedule. The time of the training unit is (30 minutes) from the main section of the lecture only, ie (8) training units.

Post-tests for the research sample:

The post tests were conducted by the researcher, the experimental and control sample, during two days at nine o'clock in the morning on the athletics track in the College of Physical Education and Sports Sciences, University of Baghdad. The researcher was keen to find the conditions and requirements of the pre-test itself and to extract the results, analyze them and discuss them after describing them in special tables prepared for this research.

Table (3) shows the results of the differences between the tribal and remote control groups

indication	**The difference between the two averages**	**experimental group**		**control group**		**Statistical processors / Variables**
		±A	-S	±A	-S	
0,03	0,06	0,2	5,70	1,29	5,5	**Run 50m from high**

						start
0,02	0,68	0,11	1,40	0,13	1,29	**One-legged fixed long jump/m**
0,00	3,4	3,19	35,9	3,13	32,5	**Vertical jump with both feet from stability/cm**
0,00	3	1,78	12	0,19	9	**Trunk bend from sitting/cm**
0,00	2,99	0,30	16,20	0,15	13,21	**Hanging in the knees bent position/sec**
0,00	3,39	1,98	20,04	1,80	16,65	**equilibrium on one foot metatarsal/sec**

It Significant at an error rate (0.05) at a degree of freedom (6) and a tabular value T(1.94)

Table (4) it shows the results of the differences between the pre and posttests of the experimental group

indication	**The difference between the two averages**	**post test**		**pretest**		**Statistical processors Variables**
		p±	**Q-**	**p±**	**Q-**	
0.02	0,98	0.91	5,98	0,82	5	Run50 m from high start
1 0.0	17 ,0	9 0.1	0 5 ,1	5 0.1	33 ,1	One-legged fixed long jump / m
1 0.0	2 5,1	40 ,3	32 , 8 3	37 ,3	2 , 3 3	Vertical jump with both feet from stability / cm
0,00	3,54	3,43	13,34	3,56	8 , 9	bend the torso from sitting / cm
0,00	2,81	2,20	17,50	2	14,69	Hanging in the knees bent position / s
0,00	7,31	1,94	24,31	1,87	17	Balance on one foot

						metatarsal / sec

Significant at an error rate of (0.05) at a degree of freedom (6) and a tabular value T equal to(1.94)

Table (5) it shows the results of the difference in the post-tests of the experimental and control groups

indication	The difference between the two averages	post test		pretest		Statistical processors Variables
		p±	Q-	p±	Q-	
0,01	0,28	0,91	5,98	1,35	53,70	Run 50m from high start
0,00	0,10	0,19	1,50	0,17	1,40	One-legged fixed long jump/m
0,00	2,42	3,40	38,32	3,19	35,9	Vertical jump with both feet from stability/cm
0,00	1,34	3,43	13,34	1,78	12	Trunk bend from sitting/cm
0,00	1,30	2,20	17,50	0,30	16,20	Hanging in the knees bent position/sec
0,00	4,27	1,94	24,31	1,98	20,04	equilibrium on one foot metatarsal/sec

Discussing the results:

The use of the training curriculum contributed to the development of the speed characteristic of the sample members through the relationship indicating strength and special motor speed, as the use of auxiliary tools works to recruit the largest possible number of motor units working in the muscles involved in performance. In addition to the compatibility in the work of these motor units.. In this regard, (Al-Rabadi, 2004, pg. 63), it is not possible to develop or develop motor speed in isolation from the development of strength, as both are linked to each other. The importance of strength exercises for the

auxiliary tools represented by the parallel device, the throat device, the jumping box and the gymnastics glove ... etc. The importance appeared in the first step, which is for the sample members to pass the factor of fear and desire for thrill and competition to play an active role in perfecting performance. The student with the tool and the effectiveness, which helped to develop some of the physical characteristics of the sequence, which achieves correct motor skill performance.(Rasheed, 2004, pg. 103) refers to (James) "the necessity of harmony between special strength training with the requirements of effectiveness in order to obtain technical motor performance The researcher also believes that the reason for the development in the level of performance is to choose the appropriate and sequential exercises in importance in the training approach, which contributed to the development of strength, speed, as well as flexibility, as we noticed the use of the experimental group for these exercises, which included Tamar The effects of running by jumping, jumping, squatting, side jumping, etc. were influential in the result of the development of some elements of physical fitness, especially the development of the two categories of strength and speed that the student needs in the stage of approaching and improving the effectiveness of pole vaulting.

This is what was indicated by (Al-Yasiri and Ibrahim, 2004, p. 11) that plyometric jumping exercises contribute to the development of speed and muscular strength by integrating the elements of strength and speed, which is called explosive power. Ability is a necessary and important element in the performance of most sports skills, especially in athletics activities.

Although there is a clear progress for the control group, this progress was statistically significant. The researcher attributes this progress to the different exercises that were used by the subject teacher, which made the results of this group significant in the post tests. But it is not in the effective and effective way that appeared on the members of the experimental group, and the researcher attributes this to the experimental group's use of purposeful exercises to develop the stages of approach and advancement, which included strength exercises for the arms, legs and back muscles, which included the muscle groups of the upper and lower extremities, which effectively affected the level of performance and confirms (Jamil, 1999, p. 316). That the Russian teacher was interested in special exercises to help develop muscle strength and gave this aspect special importance and

was confirming the end of each daily training unit on strength exercises for important areas of the body, especially for the trunk, arms and back.

Finally, we do not forget the role of stepping, running and jogging exercises by raising the knees with and without the iron bar. They also had an active role in developing speed and improving the level of performance of the approaching stage, as he indicated (Al-Rabadi, 2004, p. 154) "The development of strength characterized by speed comes through giving a similar exercise to a large extent. To achieve the required performance in competitions, but the repetition of the effort should be a little bit.

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Supplement(1)

Training Curriculum

Exercises to strengthen the muscles of the legs to improve the approach and rise phase.

1. Step forward and then switch by carrying an iron bar.
2. Mutual jumping on a low platform with a straightening man uplifting.
3. Repetitive jump over the barrier
4. Side jumping with both feet on the platform.
5. Side jump with one leg on the platform.
6. Jogging by raising the knees while carrying the barbell.
7. Half-jump-up (squatting position)
8. Half pull me up with a barbell on the shoulders.
9. Raising and ascending with the leg of the ascent to the top on the platform.
10. Raise and lower the heels on a raised edge or plank.
11. Climb and ascend above your gymnastics box by taking (3) approaching steps.
12. Running and jumping over the glove to the landing area (rug) designated for pole vaulting.
13. Attachment to climb on the shoulders of a colleague.
14. Hanging and swinging on a parallelepiped in gymnastics.
15. Hanging and swinging on the throat apparatus in gymnastics.
16. Run 20-30-50m.
17. Flexibility exercises for the abdominal and back muscles.

Supplement (2)

Model for training units

First week / first training unit

Training unit time: 30 min

Objective: Strengthening the muscles of the legs to improve the approach and rise phase

Used equipment	rest totals	totals	repetition comfort	repetition time	Repetition	exercises	Section
						Public-private warm-up	**preparatory**
One repetition time is 2-3 seconds	1 min	2	30 sec	6-9 sec	3	1- Running at a maximum speed of 20m from the high start.	**main section**
Iron bar weight 10-15 kg				15-20 sec	3	2- Stepping forward by opening the legs in front of behind a wide step, then switching (5) steps for each leg carrying an iron bar	
bench	1 min	2	30 sec	15 sec	3	3- Standing - exchanging the two legs on a low bench with the	

						movement of the arms 8 repetitions	
low barriers	1,5-1 min	2		10 sec	3	4- Repetitive jumping with both legs over (5) low hurdles	
bark	1 min	2	30 sec	10 sec	8	5- Aqala - sitting on the shoulder of the colleague and hanging on by bending and extending the arms	
	30 sec 30 sec	3 3		15-20 sec 15-20 sec	10 10	6- Abdominal exercise	
	1 min	2	30 sec	6-9 sec	3	back workout	
						Relax - light jog	**concluding**

Rest between one exercise and another 2-1 min

Second week

The first training unit

Intensity:%60

Used equipment	rest totals	totals	repetition comfort	repetition time	Repetition	exercises	Section
						Public-private warm-up	**preparatory**
gym glove	1 min	1	30 sec	2-5 sec	2	1- Running for different distances 10-30-40 meters and jumping over the glove for the landing area (rug) designated for pole vaulting.	**main section**
Iron bar weight 15 kg		1	1 min	20 sec	2	2-Running by lifting the knees with a barbell for 25m distances	
Iron bar weighing 20 kg	1 min	2		10 sec	10	3- Carrying a pilgrim bar behind the head on the shoulder and trying to get down half?? Jump up and	

						squat	
20kg iron bar + wooden pallet	30 sec	2		10 sec	20	4- Carrying an iron bar and standing on the combs on a raised ledge or wooden board and trying to raise and lower the heels from the ground.	
Gym box height 50 cm	1 min	2	30 sec		5	5-Stand at a distance of (5) m from your gymnastics box and take three approaching steps, then rise with force and high speed with the ascent leg and climb over the box with the leading leg	
shaving			30 sec	15 sec	2	6- Attachment and stability and then weighted on	

						the throat device in gymnastics	
gymnastics device	30 sec 30 sec	3 3		15-20 sec 15-20 sec	10 10	belly workout back workout	
						Relax - a light jog	**concluding**