



Impact Of Partial Method Using Two Different Styles And Multiple Aids To Learn Technical Performance And Develop Explosive Power For Take-Off Leg In Long Jump For Students

Hussein Noor Abbas

Al-Muthanna University, Faculty of Physical Education and Sports Sciences, Iraq
hussein.noor@mu.edu.iq

Abstract

This study aimed to find out the effect of the partial learning method applied with two different procedures on the students' learning and achievement in the long jump. It also attempted to find out the influence of both methods coupled with different educational methods on increasing the strength of the off-going leg's take-off power. The researcher used the experimental approach. This study adopted an experimental research method, using 150 first-year students from the College of Physical Education and Sports Sciences, Al-Muthanna University in the academic year 2024 – 2025 divided into six academic sections. The 4 sections, (C) and (D) were randomly picked by random lot and each had 23 students. A total of 40 of the students could be used for research after some of them were excluded to adapt for data equivalence and homogeneity. The results indicated statistically significant changes between the pre-test and post-test scores for both the experimental and control group following the experimental treatment in all of the variables investigated, in favor of the post-test of both groups. The difference between the two groups on the post-test was also statistically significant with the first experimental group in favor. Based on the technical sequence of movements in the long jump, the researcher believes that the superiority of the first experimental group was due to the use of the partial learning method. This facilitated mental perception of the technical performance and successfully impacted the students' skill performative as well as getting them positive results in achieving results. The various educational methods used in the curriculum also had a positive effect on long jump achievement.

Keywords: Partial Learning Method, Technical Performance, Explosive Power, Long Jump.

Introduction



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The world today is experiencing unprecedented proliferation and evolution at every aspect of life and education is not an exception. This development has neither been accidental, but occurs as the effect of intelligent scientific planning and application of various knowledge, sciences, new techniques and methods and modern education practices by researchers, scientists and specialists. They have tried to learn what is best used to practice motor skills and attain maximum athletic performance.

Over the past few years many attempts have been made to find the proper alternatives to learning and developing motor skills. This has included employing a variety of equipment and tasks within the learning environment to create a wider variety of experiences for learners and to better utilise their physical and mental capacities when learning skills. This use of such aids during skill performance is one way to reinforce and deepen the learner's experience. Furthermore, multiple ways of teaching and learning resources promotes concentration among students and makes it easier to absorb the difficult technical aspects of performance. The diversity of students in terms of their traits, capacities, and characteristics further highlights the importance of using new teaching methods and tools that are aligned with students' capacities, interest and readiness for skilled performance.

The long jump is one of the key events in sports and has been the subject of a lot of research and scientific studies in recent years, with the continuous improvement of the performance level over the years. The fact that the long jump is dependent on the successful completion of the technical phases as a prerequisite to the greatest possible distance to be covered, demands high physical, technical and mental preparedness. In this regard, the athlete has to be physically, technically and mentally prepared to perform best.

The learning process is essentially based on the transfer of information from the teacher to the learner. This transfer is made in an appropriate teaching method or learning style. The better the technique is to the learner and the skill, the easier, quicker, and better the learning is. While many things have changed in the methods and styles of learning, there is a need for a greater range of more engaging and inspiring ways of working that could enhance the effectiveness of learning experiences.

Although scientists, researchers and specialists have paid much attention to the educational process, the process of science development does not end at a certain stage. Methods of teaching and educational approaches are constantly being refreshed and enhanced to meet the needs of the learner and type of sporting activity.

During the researcher's research in teaching methods and sports, it was noted that a lot of PE students experienced problems when learning the long jump, in paying attention to the smoothness of the approach run and linking the last approach steps with a good take-off command. Some of these problems may be associated with weakness of physical functions necessary to take off, particularly the take-off leg. Hence, the take-off leg should be developed appropriately, in order to facilitate students to reach higher level of achievement with respect to the long jump without compromising the technical stages of the performances.

The process of education is a compulsory process and should be efficient and effective within a set period of time, so in this regard the importance of hastening learning through experiments and developing appropriate learning strategies in implementing the content of



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the education program. This is especially relevant if the learner's behaviour and performance is different from one educational environment or situation to another.

Research Objectives

The research's goals are to:

1. In the research sample, determine the effect of the partial method using two different approaches on students' learning and achievement in the long jump.
2. To determine the effect of enhancing and developing the explosive power of the take off leg using first approach and multiple educational means on research sample.
3. Determine the effect of the partial method through the second approach and multiple educational media on improving and developing the take-off leg / foot explosive power of the research sample.

Research Hypotheses

1. The mean pre-test and post-test scores of both experimental groups in the case of long jump are statistically significantly different with the post-test scores being higher for the students.
2. Improvement and development of the explosive power of the take-off leg by the partial method with the help of the first approach and a number of teaching aids has a positive effect on the improvement of learning and performance in the long jump event.

Research Methodology

The choice of research method is one of the crucial steps which leads to success in scientific research. Scientific method is a structured way of thinking and studying the phenomenon who want to reach reliable facts and results, scientifically organized, analyzed and presented in a logical manner.

The researcher used the experimental method for this research due to its being regarded appropriate for controlling the study conditions and investigating the effect of the variable and/or variables that are believed to be responsible to bring about a particular change.

The studied population was first year students at the College of Physical Education and Sports Sciences, Al-Muthanna University, 2024-2025 academic year. There were 150 students in six academic sections. The research sample was composed of the 1st year students; the sample is a part of the group to which the research or experiment will be conducted.

Section (C) and (D) were administered via random selection by lottery and each section had 23 students. Exclusion of a number of students was needed to facilitate more equivalence and homogeneity between the participants. Finally, the sample of the research was reduced to 40 students.

Study Tests



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Long Jump Test: Achievement & Performance.

Achievement and technical performance were measured using the Long Jump Test. The aim of the test was to measure the distances jumped by each student during the long jump and to assess the technical competence of each student by the appropriate observation by the experts who were present during the test.

All students had three opportunities and the first valid scores were recorded as the students' best for the purpose of evaluation.

Test tools used: A legal take-off board, a measuring tape to record the distance achieved during the test.

Data Collection: The distance reached by each of the students in the best valid trials was recorded. I can also create an image to explain the test procedure.

Standing Long Jump Test

This test was set up to determine the power of the leg muscles.

The tools needed are suitable jumping area of area about 1.5 m by 3.5 m. The area had to be flat, unobstructed and non-slippery. A measuring tape was also used, as was an appropriate landing area.

Performance Description: Participant stood behind take-off line with feet slightly spread and parallel, and toes near, but not on, take-off line. The participant started with swinging arms forward, down and backwards with legs bent and body leaning slightly forward. Here the arms were swung forward with great force, while the legs were extended and the ground was pushed hard by both feet, with a view to jumping forward as far as possible, as illustrated in figure (1).

Test Conditions

The jump distance was to the closest mark the participant made on landing, from the outside of the starting line. Measurement was taken to the point of contact made by the heels if the closest mark was made to the starting line by the heels.

The feet had to be off the ground simultaneously and hit on both feet at the same time. The width of starting line was 5 cm wide and was used for measurement procedures.

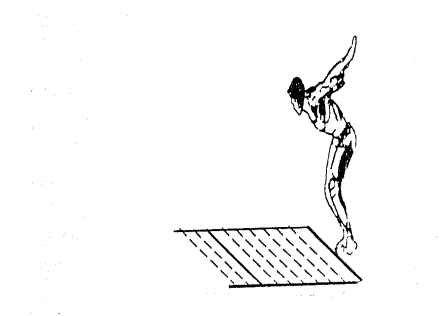


Figure 1. Standing long jump test demonstrates



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Pilot Study

The pilot study is a mini version of the experiments conducted in the main study and should, as much as possible, be done under the same conditions and circumstances as those of the main experiments to ensure its validity. The pilot study was performed in a sample of eight students in the research population who were selected by the systematic random sampling method on Sunday, 4th February 2024.

The primary purpose of the pilot study was the problem list for the researcher that he may face for the implementation of the main study. Therefore, the pilot study was conducted to answer the following questions:

- The readiness of the research sample for the necessary tests.
- The amount of time needed to carry out the tests.
- The appropriateness of the tests chosen to the research sample.
- The appropriateness and proper operation of equipment and instrument.
- The awareness and familiarity with procedures of the study on the part of the assisting work team.

Pre-Test

Testing is said to play an important role in evaluation, measurement, diagnosis and guidance of different educational curricula, programs and plans for different level, age groups. It gives a definite measure of change/effectiveness towards meeting the desired goals.

Two weeks of educational units, lasting one week each, were initially completed, giving the students the explanation of the technical phases of the long jump, as well as the correct execution of the approach run and its fixed distance, the take-off phase, the flight phase and landing phase.

The pre-test was done Wednesday 7 February 2024 at 10 am in the stadium of the College of Physical Education and Sports Sciences at Al-Muthanna University. The pre-test consisted of three trials of assessing each student's digital achievement, which was the best valid trial recorded.

Expert assessment also included an evaluation of technical performance (learning level) from various points around the event area. The long jump was evaluated through technical phases and students got the score by watching them based on their expertise.

Proposed Educational Curriculum

The proposed educational curriculum was made up of eight units of instruction plus two introduction units. Two units of instruction were carried out weekly with every unit 90 minutes in length.

Preparatory Section took 23 minutes divided into three parts. The first was a three-minute introduction, and the second was an eight-minute general "warm up" which set up the body



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for exercise. The warm up was specifically 12 minutes long, beginning with several exercises that were very directly related to the requirements of the main part of the method.

The main section was 60 minutes in duration and was the most significant part of the instructional unit. It was broken down into two sections. Instructional part was 15 minutes long and explained about the use of the proposed educational aids and how to use them, including different heights to use.

In the practical part, which was 45 minutes long, two different methods were used for each of the two experimental groups. In the first experimental group, a sequential methodology was used starting with the approach run and then passing through the various technical phases until the landing phase. Experimental group 2 started with the most crucial aspect of the event, namely the take-off phase, followed by the rest of the technical phases.

In the practical application of the experiment, different learning tools were created, such as the objects for various groups contained obstacle heights, distances and positions according to their need. The technical stages were to be aided by these aids to help with the application of the stages and help with their learning process.

The last section had a duration of seven minutes and consisted of some recreational and relaxation exercises that focused on bringing the body back to its natural state, and the closing and farewell greeting. I can also draw an image about the structure of the educational unit.

Post-Tests

The Post-test was administered on the research sample on Sunday, 10 March 2024 at 10am in the stadium of the College of Physical Education and Sports Sciences, Al-Muthanna University after the completion of the eight (8) educational units of the proposed curriculum.

The researcher made sure all the conditions of the post-test were as like as possible to the pre-test where he or she could to control experimental variables as much as possible in both time, place, assisting work team, tools and equipment.

Three legal attempts were provided for each participant for measurement of achievement and performance. The best valid attempt of the three was taken from the post test which measured the digital achievement of each student.

The level of learning (technical performance) was also determined by the technical experts in the vicinity of the event area. The experts evaluated the performance of the students based on the technical phase of the long jump, and awarded the students with corresponding scores, the best score was used for analysis.

Results and Discussion



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Data obtained from the pre- and post-test for both groups in the performance variable are summarized in the table below.

Table 1. Shows means, standard deviations, and calculated t-value for pre-test and post-test of performance variable

Group	Pre-test		Post-test		Calculated (t) value	Sig.
	Mean	St.d	Mean	St.d		
First experimental	1.05	0.519	6.15	1.327	7.592	Sig.
Second experimental	1.15	0.654	4.00	0.894	7.032	Sig.
Value of (t) is (1.729) at a degree of freedom of (19) and under a significance level of (0.05).						

From Table 1, the difference between both mean scores of the first experimental group in the pre-test and the post-test is 1.05 and 6.15 respectively with the standard deviation of 0.519 and 1.327 respectively. The calculated t value to determine the difference between the Pre and Post-test was 7.592 and tabulated t value was 1.729 with 19 d.f. and 0.05 as the level of significance. This means that the mean score for the pre-test and post-test are different in a statistically significant way for the increase for the post-test.

The second experimental group, the arithmetic mean in pre test was 1.15 with standard deviation of 0.654 and the arithmetic mean in post test was 4.00 with standard deviation of 0.894. The calculated t value for the difference between pre and post test measurements was 7.032, also this t value is higher than tabulated t value at 19 Degrees of freedom at 5% significant level, which is 1.729. This finding further validates that there is a statistically significant difference in the favour of the post-test.

From the above results, it could be concluded that both experimental groups show significantly increased difference after pre-test and post-test measurement; and the difference is in favor of the latter group (post-test). The researcher believes that the experimental group that utilized the first method with a sequential approach to the long jump task as it proceeded from the approach run to the landing stage is responsible for the improvement observed. This approach was helpful in developing the motor perception of the students and helped to develop the technical sequence of the long jump in the set of activities provided in the educational programme.

Likewise, the second experimental group taking the second manner improved their skill of coordination and motor coherence between the various technical phases of a long jump, greatly positively. This improvement was reflected in a higher level of motor performance in the post-test.

The results show that motor skills can be progressively formed and perfected through repeating, practicing, explaining and clarifying. These methods facilitate the integration of the various motor components, enhance the control of those movements and enable the motor skill to be executed more efficiently.

The results of the post test have been represented, analyzed, and discussed for both the research groups in the performance variable.



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Table 2. Shows means, standard deviations, and calculated (t) value for post-test and for two groups for performance variable

Variable	Experimental		Control		calculated (t) value	Sig.
	Mean	St.d	Mean	St.d		
Performance	6.15	1.327	4.00	0.894	6.256	Sig.
Value of (t) is (2.021) at degrees of freedom (38) and below significance level of (0.05)						

Table 2 shows that the computed t of the post-test result of the two research groups is 6.256 while the tabulated value of t obtained from t-table at d.f. = 38 and s.l. = 0.05 is 2.021. This shows that the two groups differed significantly in the outcome measured, favoring Group 1 (1st experimental group).

The researcher concludes that the sequential motor performance was improved for the first experimental group, and as a result the gain is credited to this training. Students' technical performance in the long jump technical elements was developed in a more organized and coordinated manner using the first method. This enhancement was also a result of the incorporation of special teaching and assistive aids which facilitated the correction of instructional error dealing with skill execution and also enhanced accuracy of skill performance.

Thanks to these training aids, the members of the first experimental group could make the use of body parts used in movement more effective and coordinate the various technical phases. Consequently, the students were able to carry out the necessary movement in a more efficient manner with the aim to get the technical objective.

It agrees with Khairiya which says that the mode of delivery of education and techniques could be decided depending on the sort of weakness or deficiency of performance. Where appropriate, such weaknesses can be an aid to better perform technical aspects and can further accompany the learner to practice his/her skill in a better way.

Table 3. Show means, standard deviations, and calculated t -value for pre-test and post-test of achievement variable

Group	Pre-test		Post-test		Calculated (t) value	Sig.
	Mean	St.d	Mean	St.d		
First	4.22	0.522	4.59	0.438	3.340	Sig.
Second experimental	4.13	0.320	4.27	0.447	3.038	Sig.
Value of (t) is (1.729) at a degree of freedom of (19) and under a significance level of (0.05).						

Table 3 shows that the mean scores of the first experimental group in the pre-test and the post-test were 4.22 and 4.59 while the standard deviations were 0.522 and 0.438, respectively. The difference between pre- and post-test calculated by a t value was 3.340 which is higher than the critical value of (t) at 19 degrees of freedom and 0.05 significance level. The results indicate that there is a significant difference between the pre test and the post test; and a more significant score towards the post test.



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The second group (experimental) pre test mean score was 4.13, with its SD being 0.320, and the post test mean score was 4.27 with SD of 0.447. The computed t value for mean difference before and after was 3.038 which was more than the critical t value of 1.729 at 19 degrees of freedom at 0.05 level of significance. The results obtained reveal that there is a significant difference between pre and post-test scores at 0.05 level of significance, favouring the post-test.

The above results show that both groups (experimental) obtained statistically significant differences between their pre-test and post-test writing measurements, with a post-test superiority. However, the researcher observed that he obtained the result that the two methods or approaches used in the research were effective because of the two methods or approaches in the research sample are effective. Through the various phases of performance there were improvements that led to the overall goal of the long jump "to maximize the distance jumped horizontally", which is the main motor goal of the long jump.

Relationships between the different parts of the body also improve, resulting in greater efficiency and co-ordination in the way the body moves from one part to another and between the working muscles. With the better coordination, both experimental groups had faster movement and better performance which is reflected on the total achievement distance for both experimental groups in the long leap on the post-test.

Only post test was used as a measure. The post-test was used as the measurement tool for both research groups in the Achievement variable.

Table 4. Shows means, standard deviations, and calculated (t) value for post-test and for two groups for achievement variable

Variable	First experimental		Second experimental		Calculated (t) value	Sig.
	Mean	St.d	Mean	St.d		
Achievement	4.59	0.438	4.27	0.447	2.438	Sig.
Value of (t) is (2.021) at a degree of freedom of (38) and under a significance level of (0.05).						

From the results shown in Table 4, it can be seen that the calculated t value of the post test results of the two research groups was 2.438 and the tabulated t value was 2.021 with 38 degrees of freedom at significance of 0.05. The basic conclusions one might draw from this study are that there was a significant difference between the two groups in the achievement variable as the first experimental group was superior.

The researcher believes that this outcome is due to the physical traits acquired that directly affect the technical performance of the long jump and consequently the level of achievement. The first method, which was based on the technical sequence of movements in the long jump event, as well as the educational aids used in enhancing performance had a beneficial influence on improving the effectiveness of the educational curriculum prepared by the researcher.



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The different activities and tasks used in the curriculum and activities have also reinforced specific muscles action elements to the long jump technique and encouraged their use in the right movement pathway. This made the movement more economical, accurate and facilitated overall technical proficiency. Thus the members of the first experimental group obtained better numerical results in long jump than the members of the second experimental group. To a certain extent, skill is seen as one of the benchmarks used to judge the effectiveness of performance. Progress of the learning process leads to increasingly organized and coordinated motor responses. To execute any motor skill efficiently and at high speed, specific muscle groups have to be co-ordinated and sequenced to work in an appropriate direction.

Table 5. Shows means, standard deviations, and calculated t-value for pre- and post-tests of long jump variable from a standing start

Group	Pre-test		Post-test		Calculated (t) value	Sig.
	Mean	St.d	Mean	St.d		
First experimental	2.23	0.136	2.39	0.16	2.853	Sig.
Second experimental	2.18	0.160	2.29	0.13	2.645	Sig.
Value of tabular (t) value is (1.729) at a degree of freedom of (19) and under a significance level of (0.05).						

From the result of calculation shown in table 5 can be seen that the mean score of the first experimental group in the pre test is 2.23 with standard deviation 0.136 and the mean score in the post test is 2.39 with standard deviation 0.16. It was observed that the calculated t-value for the difference between the pre-test and post-test was 2.853 and the critical t value at 19 degrees of freedom with significance level of 0.05 was 1.729. This means that the two test results (pre-test and post-test) were statistically significant (i.e. showed a statistical difference in favor of the post-test).

The mean score for the second experimental group for the pre-test was 2.18 with a standard deviation of 0.160; and for the post-test it is 2.29 with a standard deviation of 0.13. The t-value calculated was also 2.645 with a significance level of 0.05 and 19 degrees of freedom which was higher than the critical value of 1.729. The result corroborates the presence of a statistically significant difference between pre-test and post-test, in favor of the post-test.

The outcomes presented above indicate that both groups of the experiment had a significant increase in the standing long jump performance as measured by the post-test (higher scores) as compared to pre-test (lower scores). The researcher believes that this improvement in standing long jump performance is due to the performance of numerous exercises including running with jumps, standing long jumps, squat jumps, hurdle jumps and side jumps. These exercises helped to develop the legs' explosive strength and showed to be positive during the post-test results.

By combining the two, plyometric exercises help to build both speed and muscle power. Explosive power is one of the physical competencies that plays an important role in the



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successful execution of numerous sports skills, especially those in track and field activities.

Table 6. Shows means, standard deviations, and calculated (t) value for post-test and for two research groups are shown for long jump variable

Variable	First experimental		Second experimental		Calculated (t) value	Sig.
	Mean	St.d	Mean	St.d		
Standing long jump	2.39	0.16	2.29	0.13	3.095	Sig.
Value of (t) is (2.021) at a degree of freedom of (38) and below a significance level of (0.05).						

The differences in the arithmetic mean and standard deviation for the standing long jump variable between the first and second experimental groups are shown in Table 6. The means and standard deviations of the two experimental groups were 2.39 with standard deviation 0.16 and 2.29 with standard deviation 0.13, respectively.

The calculated value t was 3.095, being larger than the tabulated value t at 38 degrees of freedom and 0.05 significance level which is 2.021. The results signify that, statistically, there was a difference between the two experimental groups with the first experimental group having the advantage. So, the first method or approach has proven to be better to enhance the performance in the standing long jump and to make the legs more explosive.

The researcher concludes this is perhaps due to the diversity of jumping and leaping activities worked on and the high level of accuracy and organisation in which these activities were delivered in the first approach. These exercises were beneficial for working muscles of legs and helped increase the explosive power.

Dynamic movements, especially, exhibit great power and are considered the best indicator of explosive muscle power—a combination of strength and speed. Strength and speed can contribute in varying quantities depending on the intensity of the external resistance used, and the type of movement performed. The exercises that were presented during the first approach then may have been more appropriate for the development of this physical ability with an improvement of the standing long jump performance.

I can also produce a visual representation of these results to show the logical progression of the results.

Conclusions

Analysis of the results showed that significant differences existed before and after for all of the variables examined in both experimental groups with the post-test being greater than the pre-test scores. This shows that both these educational methods were successful in improving the performances of the participants during the experimental period.

The pen-test data of the two experimental groups showed statistically significant differences in the post-test data with equal significance at the 0.05 level in favour of the first experimental group. This shows that the first one was more successful in improving variables studied in the research.



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The application of partial learning method in the first approach that is technical movement sequence that took place in the long jump event was positive in improving the students' mental perception to learn the skill. The overall positive effect of this improvement was seen in the overall technical performance and achievements of the first experimental group.

In addition, the different teaching strategies and teaching aids used in the proposed curriculum did not hamper learning process and quantitative performance in the long jump implementation but contributed positively in achieving the goals. The use of these techniques facilitated understanding and implementation of the technical aspects of the event, and the overall development of the research sample.

Recommendations

The researcher recommends using the partial method with both approaches in teaching the long jump, with greater emphasis on the first approach based on the technical movement sequence of the event, particularly when teaching students.

When teaching the long jump in physical education colleges, attention is also needed to use reasonable auxiliary teaching tools to help students learn the technical stages and enhance the students' academic achievements.

There are many methods and indicators that can be used to guide educational curricula, such as the partial method. Using multiple education resources and education approaches can help make learning competitive, interactive, and help students get more opportunities to participate and benefit from various educational experiences.

Their use may positively impact pupils' level of technical performance and achievement and the effectiveness of the education process in general.

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