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The effect of the learning-by-play strategy on some basic movements of primary school students

Zailel Imene¹ ; Bensabeur Mohamed² ; Bitar Hicham³

¹²³ University of Mostaghanem (algeria), Laboratory for the Evaluation of Physical and Sports Activities

¹imene.zailel@univ-mosta.dz, ²mohamed.bensabeur@univ-mosta.dz,

³hichem.bitar@univ-mosta.dz

Abstract:

The study aimed to identify the effect of the learning-by-play strategy on some basic movements among primary school students (06-08) years old. The experimental approach was adopted, for a sample of (60) students, divided into (30) students as an experimental sample and (30) students as a control sample that was chosen intentionally. To collect data, we used tests for basic movements test (running test and jumping test). After collecting the results and processing them statistically processing the results, we concluded that there were statistically significant differences between the experimental sample and the control sample in favor of the experimental sample. Accordingly, we concluded that the proposed program, based on the learning-by-play strategy, has a positive effect on some basic movements among primary school students (06-08) years old. On this basis, the study recommended the necessity of adopting the learning-by-play strategy, especially in the primary education stage, due to its role in building the learner in various aspects of movement, as it provides a flexible and enjoyable educational environment.

Keywords : learning-by-play strategy; basic movements; primary school students

**Corresponding author*

1. INTRODUCTION

In light of modern educational developments, modern learning strategies have become crucial in improving the educational process, especially in primary education, which is a key stage in developing various motor and cognitive skills in learners. This stage serves as the foundation upon which students rely in the subsequent stages of their educational and professional lives. Among the educational strategies that have received significant attention is the learning-by-play strategy, which relies on the use of games and interactive activities to achieve educational and pedagogical goals. Play is considered a powerful educational tool because it combines fun and learning, which enhances students' motivation and makes them more engaged in motor activities. Furthermore, multiple educational and psychological theories emphasize the importance of play, such as Piaget's theory of cognitive development, which stresses the significance of active interaction with the environment in the development of cognitive and motor skills in children. In addition, this strategy is based on Vygotsky's theory, which focuses on the role of social interaction in learning, considering play an effective means to promote this interaction in the context of teaching basic movements.

The learning-by-play strategy is considered an effective educational tool for helping students acquire basic movements in primary education. "Vanier" emphasized that play plays an important role in developing children's basic movements, improving their neurological and muscular coordination, and contributing to the growth and stability of their motor skills (Al-Khuffaf, 2010, p. 28).

Primary school children are characterized by rapid growth, which makes them more capable of acquiring basic motor skills at a faster rate. Therefore, it is essential to take advantage of this stage to develop and enhance various motor aspects of the child. This can be achieved by selecting the most appropriate methods and strategies to support this development, through the design of educational programs that rely on play. Such programs allow teachers to promote both motor and cognitive development in learners, contributing to the formation of a generation that is healthier, more confident, and better equipped to face life's challenges. This motivated us to undertake this study, with the aim of providing a scientific contribution to this field, particularly for the Algerian school, which especially requires physical education programs and curricula at this stage, particularly with the inclusion of physical education in primary education. Based



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on this, a program was proposed, based on the learning-by-play strategy, aimed at developing some basic movements in the learner.

2. Research Questions:

1. Is there an impact of the learning-by-play strategy on some basic movements of elementary school students?
2. Are there statistically significant differences between the experimental and control groups in post-test results?
3. Are there statistically significant differences between pre-test and post-test results for the experimental group?
4. Are there statistically significant differences between pre-test and post-test results for the control group?

3. Research Hypotheses:

1. There is a positive impact of the learning-by-play strategy on some basic movements.
2. There are statistically significant differences between the experimental and control groups in post-test results.
3. There are statistically significant differences between pre-test and post-test results for the experimental group.
4. There are no statistically significant differences between pre-test and post-test results for the control group.

4. Study Objectives:

1. The study aims to highlight the impact of the learning-by-play strategy on some basic movements of elementary school students.
2. The study aims to propose educational units based on games that align with the needs and desires of students in childhood, which serve as motivation for engaging in physical activities.
3. To highlight the impact of the learning-by-play strategy in achieving comprehensive and balanced growth for this age group.
4. To support educational programs that teachers use in implementing physical education and sports classes.

5. To help elementary school teachers achieve the goals of the lesson through the use of the learning-by-play strategy, which activates the child's abilities and showcases their creativity and talents.

5. Operational Definition of the Concepts in the Research:

5.1 Learning-by-Play Strategy:

"It is a guided or unguided activity performed by the student to achieve enjoyment, fun, and entertainment during learning, which contributes to the development of their behavior and personality in emotional, educational, and social aspects." (abou loum & Al-Rashidi, 2018, p. 5)

The researcher concludes that the learning-by-play strategy is a method used by the teacher to deliver their lesson with the aim of achieving a specific goal through educational games that contribute to the development of several aspects of the learner.

5.2 Basic Movements:

These are the natural movements that an individual performs in their daily life, which are not subject to regulation or rules. These include:

- Transitional movements.
- Non-transitional movements.
- Manual processing movements. (Al-Shawish & Nail, 2011, p. 71)

The researcher concludes that basic movements are essential for the child to master and perform, as they precede skill development. They are divided into transitional movements such as running, jumping, and hopping; non-transitional movements such as static balance and dynamic balance; and manual manipulation movements like throwing, kicking, and receiving.

5.3 Elementary Education Stage:



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"Elementary school is a stage for educating the people, preparing good citizens, and preparing the child for practical life in the environment they live in. It focuses on the physical and health growth of the citizen, spiritual refinement, and the development of correct attitudes in youth, educating students about their rights and duties as citizens, and instilling a strong sense of national responsibility." (Youssef, 1955, p. 09)

The researcher concludes that the elementary stage is one of the first educational stages a child undergoes, corresponding to childhood. It helps in guiding the child and ensuring their proper development in various intellectual, skill-based, and psychological aspects, while instilling national and spiritual values and expanding their knowledge and experiences. Additionally, the child goes through three age stages in elementary education: early childhood, middle childhood (addressed in this study), and late childhood.

6. Previous Studies and Similar Researches:

6.1 Study by Taybi Hussein & It Lounis Mourad (2021): The Impact of a Proposed Physical Program with Small Sports Games on Developing Motor Skills for Preschool Children (4-5 years old).

The study aimed to examine the effect of a proposed physical program with small sports games on the development of motor skills for preschool children (ages 4-5). The researchers used an experimental method, with a sample of 56 children from the preparatory year (2018/2019), who were selected intentionally and divided into two groups: one experimental and the other control, with 28 children in each group. The results showed that the proposed physical program had a positive effect on developing motor skills for preschool children. The researcher recommends using the program due to its effective impact on developing motor skills.

6.2 Study by Harbash Ibrahim, Faghoul Al-Senousi, & Jaghdam Ben Dheiba(2015):

The Effectiveness of the Teaching Strategy by Play in Developing Some Physical and Motor Skills in Secondary School Students (16-18 years old),

University of M'Sila ,This study aimed to examine the effectiveness of the play-based teaching strategy in improving physical and motor skills in secondary school students (ages 16-18). The researchers concluded that the play-based teaching strategy led to improvements in some physical and motor skills in the students of this age group.

6.3 Study by Abdul Hafeez Qadiri (2015):

The Effect of a Proposed Program with Small Games on Developing Speed (Transitional Speed and Reaction Speed) in First-Year Secondary Students (11-12 years old) at Sétif Briqa Secondary School, Batna Province, This study aimed to examine the effect of a proposed program with small games on developing speed attributes (transitional speed and reaction speed) in a sample of first-year secondary students (11-12 years old). The experimental method was used, with a program designed that lasted 12 weeks, consisting of 12 educational units, each lasting 50 minutes. The results showed statistically significant differences in favor of the experimental group in the research tests.

6.4 Study by Kadour Ibrahim, Ayad Mustafa, & Ben Si Kadour Habib (2018):

The Effect of Using Play-Based Teaching Strategy on Developing Some Physical and Motor Skills in Primary School Students (8-9 years old) , The study aimed to explore the impact of using the play-based teaching strategy in improving physical and motor skills in primary school students (8-9 years old). The experimental method with two groups (experimental and control) was adopted. The study was conducted on a sample of 30 students in the experimental group and 30 students in the control group. A series of tests for physical and motor skills were applied, and the results showed that the play-based teaching strategy led to the development of some physical and motor skills in primary school students.

6.5 Study by Hamani Magdy El-Amri & Ben Hajj Djilali Ismail (2022): The Effect of Using Play-Based Teaching Strategy on Developing Speed and Strength in Fifth-Year Primary Students (9-11 years old). The study examined the impact of using the play-based teaching strategy on



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developing some physical traits (speed and strength) in fifth-year primary students (9-11 years old). The research aimed to highlight the effect of the play-based teaching strategy on some physical traits. The final results indicated that the proposed educational units using the play-based teaching strategy had a positive impact on developing physical traits, specifically speed and strength.

7. Methodological Procedures Followed in the Study:

7.1 Method and Tools:

- **Approach Used:** The experimental approach was adopted due to its suitability for the nature of the topic.

- Exploratory Study:

The exploratory study was conducted from 10/01/2024 to 17/01/2024 with a sample of 10 students from a second-year class (ages 6-8) at Khadija Umm al-Mu'minin Primary School in Oran. The tests were applied to the exploratory sample and re-administered after 10 days under the same conditions. This was done to identify potential challenges that could be faced during the implementation of tests, determine the time required to perform the tests, evaluate the appropriateness of the tools used, and assess their suitability for the students.

- Sample and Selection Method:

The research population consisted of second-year primary school students at Khadija Umm al-Mu'minin Primary School, with a total of 70 students. The sample was divided into two groups: the experimental group (30 students) and the control group (30 students). The sample was selected intentionally.

- Study Fields:

- **Human Field:** Students from Khadija Oum al-Muminin Primary School, Oran, ages 6-8 years.

- **Time Field:** From 01/02/2024 to 21/03/2024.
- **Location Field:** Khadija Oum al-Muminin Primary School.
- **Study Procedures:**
- **Independent Variable:** Play-based learning strategy.
- **Dependent Variable:** Basic motor skills.
- **Research Tools:** The research relied on tests for basic motor skills (running, jumping), which were chosen based on previous studies and presented to experts. The tests included:
 - **Running Test (25 meters):**
 - **Purpose:** To measure transitional speed.
 - **Tools:** Whistle, stopwatch.
 - **Performance Specifications:** The participant starts from the starting line and, upon hearing the whistle, runs at maximum speed to the end of the distance.
 - **Recording:** The time it takes to cover the distance between the starting line and the finish line, recorded to the nearest 0.1 seconds.
 - **Standing Long Jump Test:**
 - **Purpose:** To measure forward jumping ability.
 - **Performance Method:** The participant stands behind the starting line with feet slightly apart, arms raised. They swing their arms forward and jump as far as possible.
 - **Recording:** The distance from the takeoff line to the last point of landing is measured.
- **Proposed Educational Program:**



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The proposed program was designed based on purposeful games by reviewing a variety of references related to game-based programs and movement studies. The aim was to create educational units that align with the child's capabilities and match the tested age group. Expert opinions were used to standardize the measurement tools and select the most appropriate tests for basic motor skills and goals.

A total of 12 educational units were proposed, with two units per week, each lasting 1 hour. These were divided into three phases:

- Preparation Phase: 10 minutes.
- Main Phase: 40 minutes.
- Closure Phase: 10 minutes.

The program targeted running and jumping games and was implemented from 04/02/2024 to 14/03/2024. The pre-test was conducted from 23-25/01/2024, and the post-test from 18-20/03/2024.

- Foundations for Designing the Proposed Educational Units:

- The design of the educational units for primary school children (ages 6-8) took into account the following:
- Considering the school's facilities and available equipment to ensure easy implementation.
- Gradual progression in the use of educational games, from easiest to hardest.
- Using suitable, easy-to-use tools while ensuring safety.
- Varied use of tools, such as different colored items, small and large balls, hoops, ropes, and markers.
- Taking into account the psychological, physical, and social characteristics of the age group.

- Scientific Foundations for the Tool:

To calculate the validity and reliability of the study's tests, we used the application-reapplication method and the Cronbach Alpha coefficient. The results obtained are shown in the following table:

Table 1: Validity and Reliability of Study Tests

Tests	Measurement	Correlation Coefficient	Significance Level	Reliability Coefficient
Running	First Measurement	0.997	0.001	1.00
	Second Measurement			
Jumping	First Measurement	0.940	0.001	0.978
	Second Measurement			

Source: Prepared by the researchers based on SPSS output.

The results presented in Table 1 reflect a high level of validity and reliability for the study's tests, using both the test-retest method and Cronbach's alpha coefficient. The high correlation coefficients (0.997 for the running test and 0.940 for the jumping test) indicate a strong relationship between the first and second measurements, demonstrating a high degree of temporal consistency. Additionally, the statistical significance levels (0.001) confirm the significance of these values. Moreover, the extremely high reliability coefficients (1.00 for running and 0.978 for jumping) suggest that the tests possess significant credibility and reliability, further enhancing the trustworthiness of the data derived from the study. These results demonstrate that the tools used are capable of accurately and consistently measuring the relevant variables, thereby supporting the overall validity of the study's findings.

- Statistical Tools

The data were subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS: V27) and EXCEL software for designing graphical representations. The following statistical methods were employed:

- **Independent Samples T-test:** This test was used to compare the means of two independent groups (experimental and control groups).

- **Paired Samples T-test:** This test was used to compare the means of two related groups (pre-test and post-test for the same group).
- **Effect Size using Cohen's d:** This was used to measure the effect size when conducting the paired samples T-test.

8. Presentation and Analysis of Results:

8.1 Presentation and Analysis of the First Hypothesis:

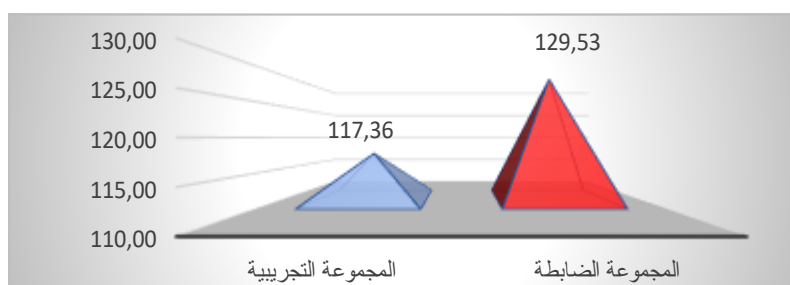
There is a positive effect of the learning-by-play strategy on some basic movements in elementary school students.

Table 2: Results of the First Hypothesis

Group	Sample Size	Mean	Standard Deviation	T-Test Value	Significance Level	Cohen's d (Effect Size)
Experimental Group	30	117.36	16.90	-2.75	0.008	17.11
Control Group	30	129.53	17.31			

Source: Prepared by the researchers based on SPSS outputs.

Figure 1: Illustrates the difference between the two groups.



Source: Prepared by the researchers based on EXCEL .

The result of this hypothesis indicates that the proposed program, based on play, has an effect on some basic movements. The results showed statistically significant differences between the experimental group (which underwent the program) and the control group (which did not). The mean for the experimental group was 117.36, compared to 129.53 for the control group, with a T-test value of -2.75 and a significance level of 0.008, indicating that the differences are statistically significant at a level lower than 0.05. Furthermore, the effect size (Cohen's d) was 17.11, reflecting a significant impact of the program on basic movements. These results reflect the effect of the proposed program and emphasize the importance of using play as an educational tool to improve basic movements in children.

9.2 Presentation and Analysis of the Second Hypothesis Results:

Hypothesis: There are statistically significant differences between the experimental and control groups in the post-test results.

Table 3 : Results of the Second Hypothesis

Tests	Group	Sample Size	Mean	Standard Deviation	T-test Value	Significance Level	Effect Size (Cohen's d)
Running	Experimental Group	30	4.27	0.51	-10.32	0.000	0.54
	Control Group	30	5.71	0.56			
Jumping	Experimental Group	30	129.53	17.31	5.72	0.000	13.86
	Control Group	30	109.03	9.20			

Source: Prepared by the researchers based on SPSS program outputs.

The results of the second hypothesis indicate statistically significant differences between the experimental and control groups in the post-tests, reflecting the positive impact of the proposed program on the development of fundamental movements.

In the **running test**, the experimental group recorded a lower mean time (**4.27 seconds**) compared to the control group (**5.71 seconds**), indicating a clear



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improvement in running speed. The **T-value** was **-10.32** with a significance level of **0.000**, confirming highly significant differences. The **effect size (Cohen's d)** was **0.54**, suggesting a moderate impact of the program on enhancing running speed.

In the **jumping test**, the differences were even more pronounced. The experimental group achieved an average jump distance of **129.53 cm**, compared to **109.03 cm** in the control group. The **T-value** was **5.72**, with a significance level of **0.000**, highlighting a highly significant improvement. The **effect size (Cohen's d)** was **13.86**, indicating a very strong impact of the program on children's jumping ability.

These findings confirm that the proposed program has positively contributed to improving fundamental movements among children, particularly in jumping, where the impact was more evident. The results emphasize the importance of using play-based learning strategies as an effective tool for developing children's motor skills in primary education.

9.3 Analysis and Interpretation of the Third Hypothesis Results:

There are statistically significant differences between the pre-test and post-test results for the experimental group.

Table 4: Results of the Third Hypothesis

Test	Group	Sample Size	Mean	Standard Deviation	T-Value	Significance Level	Effect Size (Cohen's d)
Running	Experimental Group	30	4.94	0.830	0.750	0.000	0.56
	Control Group	30	4.27	0.510			
Jumping	Experimental Group	30	117.37	16.90	0.920	0.000	6.80
	Control Group	30	129.53	17.31			

Source: Prepared by the researchers based on SPSS outputs.

The results indicate statistically significant differences between the pre-test and post-test measurements for the experimental group, reflecting the positive impact of the proposed program on improving students' motor performance.

In the running test: The results showed a notable improvement, as the average time decreased from 4.94 seconds in the pre-test to 4.27 seconds in the post-test, indicating an increase in running speed. The T-value was 0.750, with a significance level of 0.000, and a moderate effect size (0.56), suggesting a positive but moderately strong effect of the program on developing running skills.

In the jumping test: A significant improvement was observed, with the average jump distance increasing from 117.37 cm in the pre-test to 129.53 cm in the post-test, reflecting a clear enhancement in jumping ability. The T-value was 0.920 at a significance level of 0.000, with a very large effect size (6.80), indicating a highly significant impact of the program on improving this skill.

These results highlight the effectiveness of the play-based educational program in enhancing fundamental motor skills in students. The program contributed to increased running speed and significant improvement in jumping ability, demonstrating its importance in fostering children's motor development in an engaging and effective manner.

9.4 Analysis and Interpretation of Hypothesis Four:

There are no statistically significant differences between the pre-test and post-test for the control group.

Table 5: Results of Hypothesis Four

Test	Group	Sample Size	Mean	Standard Deviation	T-Value	Significance Level	Effect Size (Cohen's d)
Running	Pre-Test	30	5.83	0.57	0.970	0.000	0.120
	Post-Test	30	5.71	0.56			
Jumping	Pre-Test	30	103.97	8.57	0.710	0.000	6.76
	Post-Test	30	109.03	9.20			

Source: Prepared by the researchers based on SPSS outputs.

The results of Hypothesis 4 suggest that there were no statistically significant differences between the pre-test and post-test for the control group, as they did not undergo the proposed program.

In the **running test**, the mean slightly decreased from 5.83 to 5.71, with a T-value of 0.970 and a significance level of 0.000, indicating a very small effect size (Cohen's $d = 0.12$).

In the **jumping test**, the mean slightly increased from 103.97 to 109.03, with a T-value of 0.710 and a significance level of 0.000, showing a relatively large effect size (Cohen's $d = 6.76$). This could suggest a natural variation in performance rather than an outcome of the program.

These findings reflect the **stability of the control group's performance**, strengthening the reliability of the results obtained from the experimental group and emphasizing the **program's role** as the primary factor in improving fundamental movement skills.

10. Discussion of Results and Interpretation:

After analyzing the results obtained, it became evident that the proposed program based on the learning-through-play strategy had a positive impact on fundamental movements. This was confirmed by the statistical differences between the experimental group, which underwent the program, and the control group, which did not. The results of Hypothesis 2 showed significant differences in the post-test in favor of the experimental group, which underwent the proposed program, highlighting the program's effect in achieving a noticeable improvement in the basic movements of the experimental group. An improvement in the performance of the experimental group was observed compared to the control group in the post-tests. The better performance of the experimental group reflects the positive impact of the intervention, which was based on play, as the individuals in this group recorded higher or more developed results compared to the control group. This was confirmed by the results of Hypotheses 3 and 4, which showed stability in the performance of the control group in the post-test, unlike the experimental group, which underwent the proposed program. This reflects the program's effectiveness, as the results showed that children in the experimental group recorded significant improvement in running and jumping, with significant differences found between the pre-test and post-test results.

These differences indicate that the program contributed to the improvement of fundamental movements, confirming its effective role as an educational and developmental tool. The results support the adoption of such programs as an educational means to achieve holistic motor development for children, especially when designing programs aimed at developing their motor skills sustainably.

Furthermore, the study highlights the potential use of play-based programs in developing fundamental movements, which contributes to achieving comprehensive developmental goals for children in an innovative and effective way. It also emphasizes the importance of adopting the learning-through-play strategy in educational and pedagogical programs. Play not only enhances motor development but also creates an interactive and encouraging environment for children, contributing to the development of their physical, psychological, and cognitive skills. Clement (1985) emphasized that play is a free activity and a pleasurable, intentional form of self-expression through which children meet their needs. This helps overall growth physically, mentally, and socially through interaction with peers and leaders, acquiring experiences that shape their behavior and develop aspects of their personality. Additionally, "Bruner," a leader of the



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cognitive school, affirmed Piaget's perspective, stating: "Play represents the serious work that a person does to achieve balanced and integrated growth. It is the most important work for a child to develop knowledge and concepts. It is also a tool for cognitive growth and the construction of a child's social character in various stages of their development". (Hila, 2007, p. 72)

The proposed program is an effective tool to achieve educational and developmental goals related to movement, as it was designed and implemented with care, taking into account the characteristics of the developmental stage and using the most suitable educational methods. Therefore, teachers should adopt the learning-through-play strategy as an effective means of improving fundamental movements. This has been recommended by studies such as (Taybi Hussein & Ait Lounis Murad, 2021) and (Harbash Ibrahim & Others, 2015). Our study aligns with the findings of (Abdelhafid Qadri, 2015), who used the play strategy in his research and found significant statistical differences in favor of the experimental group in the test results. It also aligns with the study by (Kaddour Ibrahim & Others, 2018), where the researchers concluded that the play-based teaching strategy led to the development of certain physical and motor abilities in primary school students aged 8-9 years. Additionally, the study by (Hamani Majdi Al-Omri & Ben Hajj Jilali Ismail, 2022) found that the play-based teaching strategy applied to the experimental group positively affected the development of certain physical traits (speed and strength).

This confirms the validity of the adopted hypotheses.

11. Conclusion:

The learning-through-play strategy is one of the most important modern educational strategies, especially in elementary education, as it relies on games as an educational tool to achieve specific outcomes. This strategy has proven effective in the physical development of children, which was confirmed by our study. In this study, we proposed a program based on the play strategy aimed at improving fundamental movements in elementary school students. After analyzing the results, the following conclusion was reached:

- The proposed educational program using the learning-through-play strategy has a positive effect on fundamental movements in the research sample.

In light of these results, we propose the following recommendations:



- Developing educational programs for elementary school children based on the learning-through-play strategy.
- The necessity of using the learning-through-play strategy for elementary school children due to its importance in developing fundamental movements and improving motor skills.
- Providing further scientific research on different samples and other basic movements.
- Ensuring the availability of sports equipment and resources to enhance physical education lessons.
- Taking into account the characteristics of the age stage when preparing educational program



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