Journal of Applied Sports Science
December 2024, Volume 14, No. 2
www.jass.alexu.edu.eg

The Impact of Using Flipped Learning on Enhancing Certain Physical Abilities and Complex Basic Skills for Basketball Juniors.

Assist. Prof. Islam Salah El-Sayed El-Shaer [(1)], Dr. Taher Saad Abu Al-Asaad Mohamed [(2)]

(1) Assistant Professor of Curriculum and Teaching Methods in the Department of Curriculum and Teaching Methods for Physical Education – Faculty of Physical Education for Boys – Alexandria University.

(2) Lecturer in the Department of Sports Training – Faculty of Physical Education for Boys – Alexandria University.

Abstract:

This study aimed to explore three dimensions:

- *Scientific Level: To provide a new practical framework connecting flipped learning with sports training for basketball juniors.*
- *Practical Level: To enhance coaches' skills by employing modern strategies that improve children's physical and skill performance.*
- *Educational Level: To encourage active participation among juniors and develop their skills by integrating theoretical learning with practical application.*

The primary objective was to investigate the impact of flipped learning on improving specific physical abilities and complex skills in basketball juniors at the Academy of the Faculty of Physical Education for Boys, Alexandria University.

Hypotheses:

The study was based on the following hypotheses:

1. *First Hypothesis: There are statistically significant differences between the pre- and post-measurements of the control group in specific physical abilities and complex motor skills in basketball juniors.*
2. *Second Hypothesis: There are statistically significant differences between the pre- and post-measurements of the experimental group in specific physical abilities and complex motor skills in basketball juniors.*
3. *Third Hypothesis: There are statistically significant differences in the post-measurements between the experimental and control groups in specific physical abilities and complex motor skills in basketball juniors.*

The researchers employed the experimental approach (using a pre-test and post-test design). One of the tools used was an evaluation form to assess the performance of certain basketball motor skills among juniors.

Findings:

In light of the study's objectives, hypotheses, and results, the researchers concluded that the flipped learning method significantly improved the specific physical abilities and complex motor skills of the experimental group compared to the control group during post-measurements..

Keywords: *(Flipped Learning, Specific Physical Abilities, Complex Skills for Basketball Juniors)*

Introduction:

One of the most critical requirements for achieving modern objectives in teaching and training motor skills is moving away from the traditional (educational training) system and repetitive, outdated information transferred from one source to another. Modern educational sports academies for training athletic activities, including basketball, aim to develop training methods, content, and teaching techniques. Contemporary scientific approaches advocated by basketball training specialists emphasize the need for diversification in methods, techniques, and educational strategies. (15:86)

The science of physical education seeks to help juniors achieve comprehensive and integrated growth through the components of the training system (objectives, coach, player, curriculum, environment, and teaching and training methods). This is accomplished through productive interaction among these components, particularly the interaction between the coach as a leader and guide in the training context and the player as the beneficiary and participant in the training process.

Training positively influences the development of new players on modern scientific foundations. The progress of these players can be measured by their understanding and application of modern training theories, strategies, methods, and techniques

Experts explain that training programs no longer focus solely on the quantity of information provided to juniors. Instead, they emphasize the strategies and methods juniors use to acquire information from various sources.

Therefore, it is essential to reconsider training programs and provide the necessary resources, especially technological ones, for players to access information. This ensures an effective training process and transforms traditional training methods prevalent in some academies into modern approaches and techniques. These changes aim to foster creative thinking and innovation among coaches and players, leveraging the information age and modern technologies.

The processes of learning and training at all age levels are among the most significant factors influencing the rapid progress and development of the sports community. They are the primary sources for developing players with intellectual abilities, physical competencies, technical skills, and valuable behaviors that enable them to interact intelligently with the realities of the present and future changes.

Study Problem:

The need to adopt modern methods that shift the concept of traditional training to a new perspective is pressing. This transformation focuses on enabling players to utilize and produce information rather than merely acquiring it. Such an approach allows players to demonstrate their physical and technical abilities, develop critical thinking, creativity, and innovation, and appreciate what aligns with their capabilities and interests. Furthermore, it encourages their active participation to enhance the level and effectiveness of training. (13:30-43).

Through the work of one of the researchers at the Boys' Faculty of Physical Education Club in Alexandria and by tracking the results of the junior basketball teams at the club, it was noted that there is a decline in the performance levels of some Motor skills, especially complex skills, have shown a decline in performance. Discussions among the researchers and reviews of related studies (1)(2)(3)(5) emphasize that the coach's choice of appropriate training methods and techniques is one of the critical pillars for the success of the training process. The effectiveness and success of any method are measured by how well it utilizes processes that stimulate the player's ability to understand the skills they are learning, relying on their personal experiences.

Thus, training methods require sufficient attention, specialized skills, and continuous effort from both the coach and the trainee, as they serve as tools for organizing experiences and transferring knowledge. The skill lies in selecting appropriate methods that foster interaction between the coach and the player, as well as between the player and the training material.

Basketball, in particular, relies on a set of specific physical abilities and complex skills that require continuous development, especially for juniors who form the foundational base for shaping future players.

However, sports training for children faces several challenges, including:

- The lack of active engagement of juniors in the training process due to reliance on traditional methods that do not align with their needs and interests.
- The need for modern educational methodologies that incorporate technology and interactive training to develop physical and technical abilities.
- Insufficient integration of flipped learning into the sports field as an innovative method to motivate children and enhance their self-directed learning.
- Flipped learning, as a modern educational model, provides juniors with the opportunity to learn in a comfortable and open environment, focusing on practical application during training. However, studies addressing the role of this model in enhancing specific physical abilities and complex skills in junior basketball players remain limited, highlighting the need for further research in this field (7:563-580).
- Scientific research has shown that flipped learning plays a significant role in improving physical abilities and skills among juniors and basketball players. According to a study by Bergmann and Sams (2012) (4), this educational approach enhances students' understanding and engagement in classrooms, positively impacting their academic and athletic performance. This is corroborated by studies conducted by Safaa Ghazi (2022) (2), Israa Abdel Aal (2023) (1), and Haider Abdullah and Ali Hussein (2023) (3), which indicate that students learning through this method exhibit higher levels of participation, interaction, skills, and abilities compared to traditional methods.
- A key factor in the success of flipped learning is empowering learners to take control of their learning process. This approach allows students to review and revisit educational content as needed, enhancing their comprehension of the material. This is particularly significant for junior basketball players, who can follow training sessions and technical methods through videos at home, freeing up more time during practice sessions for skill application under the supervision of coaches (12:34-35).
- The study by Hung (2015) (10) confirmed that using flipped learning contributes to developing students' physical and cognitive abilities by focusing on practical activities and interactive discussions.
- Additionally, research findings indicate that flipped learning supports the development of physical abilities and complex skills among juniors. Talbert (2017) (15) highlighted that dedicating training sessions to practical activities instead of theoretical lectures enhances students' physical performance. This approach provides an interactive training environment where players can apply the skills they have learned, resulting in comprehensive improvements in both their physical and technical capabilities.

- With the rapid advancement of technology and digital education, adopting flipped learning in junior training has become increasingly important. Interactive, technology-based educational environments play a significant role in developing players' skills and enhancing their physical abilities, positively impacting their performance in sports competitions. According to Bishop and Verleger (2013) (5), the flipped learning method offers tangible educational benefits, with trainees showing significant improvements in performance and achievement when interactive technologies are integrated into the training process.
- Flipped Learning is a modern educational approach designed to promote interaction and active learning among participants. This model transcends traditional teaching and training methods, which rely heavily on theoretical lectures in classrooms. Instead, the educational content is transferred to the home through digital media, while class time and training sessions are reserved for interactive activities and practical applications (8:490).

Providing an interactive, technology-based educational environment can significantly contribute to developing players' skills and enhancing their physical abilities, positively impacting their performance levels, especially in complex skills during sports competitions (11:53-55).

Flipped Learning:

Definition of Flipped Learning:

Flipped Learning is an innovative educational approach that restructures the traditional roles of teacher and student in the learning process. This method delivers core educational content to students at home through digital media such as recorded videos and interactive lectures. Classroom time is then dedicated to practical activities, group discussions, and problem-solving under the teacher's direct supervision.

Significance of Flipped Learning:

The importance of flipped learning is highlighted through several key aspects:

1. Enhancing Active Interaction:

Flipped learning encourages greater interaction between students, their teacher, and peers, leading to a deeper understanding of the educational material.

2. Personalized Learning:

It allows students to control the pace of their learning by rewatching educational materials based on their individual needs.

3. Developing Critical Thinking:

The approach motivates students to apply the knowledge they acquire to solve problems in an interactive learning environment.

4. Efficient Use of Time:

Classroom time is devoted to hands-on activities, which helps reinforce understanding and develop practical skills.

5. Enhancing Independent Learning:

It encourages students to take responsibility for their own learning, motivating them to engage in self-exploration.

Objectives of Flipped Learning

Flipped learning aims to achieve several educational **objectives, including:**

1. Improving Deep Understanding:

By allocating more time for interactive activities within the training environment, students can gain a deeper understanding of the material.

2. Developing Practical Skills:

Providing students with the opportunity to apply what they've learned in an active learning environment.

3. Enhancing Learning Independence:

Supporting students in acquiring knowledge independently through digital resources.

4. Promoting Collaboration:

Offering group activities and discussions that foster teamwork and collaborative problem-solving

Stages of Designing Flipped Learning:

To implement flipped learning successfully, the following clear stages should be followed:

1. Preparing Digital Content:

Create engaging and interactive educational materials such as videos and e-articles that learners can access outside of the real training environment.

2. Setting Educational Objectives:

Establish clear goals for what learners should achieve through the digital materials and training activities.

3. Planning Classroom Activities:

Design practical and interactive activities focused on reinforcing understanding and practical application, such as group projects and interactive discussions.

4. Providing Resources and Support:

Ensure the availability of tools and platforms needed to access the educational content, while offering technical support to learners.

5. Assessing and Improving the Process:

Regularly evaluate the effectiveness of the flipped learning approach and make improvements to enhance the learning experience.

Collect feedback on the effectiveness of flipped learning and apply adjustments to improve the educational experience.

Use a variety of assessment tools to measure goal achievement and identify areas for improvement. (8:492) (9:159-190) (11:22-24).

Galindo-Dominguez (2021) points out that flipped learning is an effective tool in developing students' skills and abilities. In his research, he clarifies that this approach contributes to enhancing deep understanding of the curriculum and developing critical thinking skills. By transforming traditional education into a model that uses class time for practical application and discussions, students can make better use of educational resources.

Galindo-Dominguez (2021) emphasizes that flipped learning not only focuses on information absorption but also enhances collaboration among students, encouraging active participation in the learning process. In this model, educational environments become interactive spaces for idea exchange, rather than just places for receiving

information. The success of this model depends on the preparation of well-designed digital content by educators, along with interactive educational activities that promote player engagement and enhance their understanding of specific skills and abilities (16:26).

The Importance of Flipped Learning in Enhancing Physical Abilities and Complex Skills:

1. **Enhancing Deep Understanding of Physical Concepts:**

Flipped learning allows players to study the theoretical foundations at home through educational videos and recorded training materials. This gives them sufficient time to understand concepts more deeply. When players attend class, they are ready to apply what they have learned theoretically to physical and motor activities, enhancing their comprehension and improving their efficiency.

2. **Increasing Practical Training Time:**

By dedicating classroom time to hands-on activities, flipped learning provides more opportunities for players to practice and refine their skills in a supportive environment.

3. **Increasing Practical Training Time:**

Since the theoretical content is reviewed at home, class time can be entirely dedicated to practical training. This approach allows players to intensively practice specific physical abilities and complex motor skills, leading to improved physical capacities and skills needed in a particular sport like basketball.

4. **Developing Complex Skills:**

Complex skills require intensive and varied practical training. With flipped learning, coaches can design diverse applied activities within the training sessions that focus on developing these skills. Players can work on multiple skills simultaneously, such as passing, shooting, and tactical movements in basketball, enhancing their ability to perform these skills in an integrated manner.

5. **Encouraging Self-Learning and Responsibility:**

Flipped learning encourages players to take responsibility for their own learning. When students know that they must study theoretical material at home, they are more motivated to learn independently. This boosts their academic achievement and practical application, contributing to the improvement of their physical abilities and complex skills.

6. **Enhancing Interaction and Collaboration:**

In traditional classes, the interaction between players and the coach might be limited. However, with flipped learning, the coach's role shifts to that of a facilitator, which enhances the interaction between players and coaches. Players can work together in groups, fostering teamwork and collaboration, which is crucial for developing complex skills in team sports.

7. **Leveraging Modern Technologies:**

Flipped learning heavily relies on technology, using educational videos and interactive applications to make the learning process more engaging and effective. Players can use these tools to repeat exercises and review skills, helping them to continuously improve their physical performance.

8. **Providing a Supportive Learning Environment:**

Flipped learning creates a supportive educational environment where players can ask questions and receive immediate feedback from the coach during practical activities. This instant feedback helps correct mistakes and improves performance more quickly (6:289-297)(14:85-95)(16:39).

Basketball is a team sport that requires high coordination between physical abilities and motor skills. Complex motor skills in basketball include passing, dribbling, shooting, and off-the-ball movement, which are essential for developing overall player performance. Effective execution of these skills requires synchronization between motor and skillful abilities, especially when making quick decisions during play (17:71).

Based on the previous discussion, the researchers raised the question:

9. **To what extent can the flipped learning model contribute to improving the physical abilities and complex skills of young basketball players?**

Importance of the Study:

- **At the scientific level:** The study provides a new applied framework that connects flipped learning with sports training for basketball youth players.
- **At the practical level:** The study enhances coaches' skills by utilizing modern strategies that improve the physical and skill performance of children.
- **At the educational level:** The study encourages young players to actively participate and develop their skills through the combination of theoretical learning and practical application.

Study Objective:

To investigate the effect of flipped learning on improving the performance of certain specific physical abilities and complex skills for basketball youth players at the Faculty of Physical Education for Boys, Alexandria University.

Study Hypotheses:

1. **First hypothesis:** "There are statistically significant differences between the pre- and post-tests in the specific physical abilities and complex motor skills of the basketball youth players in the control group."
2. **Second hypothesis:** "There are statistically significant differences between the pre- and post-tests in the specific physical abilities and complex motor skills of the basketball youth players in the experimental group."
3. **Third hypothesis:** "There are statistically significant differences between the experimental and control groups in the post-test results in the specific physical abilities and complex motor skills of the basketball youth players."

Study Procedures:

- **Methodology:** The researchers used an experimental method (with a pre- and post-test design) to study the effect of flipped learning on improving physical abilities and developing some complex motor skills in basketball for youth players. Two groups were used:

one experimental and one control, as it is suitable for the nature of this study.

- **Study Population and Sample:**

The study population consisted of basketball youth players born in 2016-2017 at the Faculty of Physical Education for Boys, Alexandria University, for the 2023-2024 academic year, totaling (80) players.

- **Exploratory Sample:**

An exploratory sample was randomly selected from the study population but outside the main sample, consisting of (11) players, accounting for (13.75%).

- **Main Sample:**

The main sample was randomly selected from within the study population but outside the exploratory sample, consisting of (40) players, accounting for (50%). The players were divided into two groups: experimental (20 players) and control (20 players).

Homogeneity of the Basic Sample:

The researchers ensured the homogeneity of the total sample in terms of age, height, weight, and some physical and skill-related variables by calculating the skewness coefficient for these variables. Tables (1), (2), (3), (4) describe the sample based on these variables. (Appendix 2)

Equivalence of the Basic Sample:

The researchers ensured equivalence between the experimental and control groups by finding the significance of the differences between the means of the two groups in the study variables. (Appendix 3).

Study Tools:

The researchers gathered information and data for this study as follows:

- **Survey of Specialized References:** A survey of specialized references was conducted to assist in preparing the program and evaluation forms for the physical abilities and skills under study.
- **Personal Interviews with Experts:** The researchers conducted personal interviews with specialists in physical education curricula, teaching methods, psychology, measurement and evaluation, and basketball. The aim was to gather their opinions on the skill performance evaluation form, the proposed educational program, and its tools. (Appendix 1)

Physical Tests:

- The researchers conducted a survey of scientific references specialized in basketball to identify physical tests that measure physical abilities directly related to the complex skills under study. Table (4) shows the percentage of agreement among experts regarding these tests. (Appendix 4)

Table (4)
Percentage of Experts' Opinions on the Most Important Physical Ability Tests for Middle School Students (N=4)

N	*Physical Abilities*	*Tests*	*Agree*	*Disagree*	*Percentage of Agreement (%)*
1	*Muscular Strength*	*Vertical Jump Test (Explosive Strength)*	*4*	*0*	*100%*
		Back Muscle Strength Test	*0*	*4*	*0 %*
		Standing Long Jump Test	*1*	*3*	*25%*
2	*Agility*	*Inclined Push-up Test*	*1*	*3*	*25%*
		Zigzag Running Test (Barrow's Method)	*4*	*0*	*100%*
		Hurdle Zigzag Running Test	*0*	*4*	*0 %*
3	*Accuracy*	*Trunk Flexion and Shooting Test*	*0*	*4*	*0 %*
		One-Handed Shooting Test	*0*	*4*	*0 %*
		Shooting on Basket (Accuracy)	*4*	*0*	*100%*
4	*Speed and Flexibility*	*Fast Running with Direction Change*	*4*	*0*	*100%*
		6-Second Running Test	*2*	*2*	*50%*
		30m Sprint from a Moving Start	*1*	*3*	*25%*
5	*Coordination*	*Carriage Pass Test*	*0*	*4*	*0 %*
		Numbered Circles Test	*1*	*3*	*25%*
		Passing and Catching the Ball Test (Coordination)	*4*	*0*	*100%*

Table (4) shows the percentage of experts' opinions on the most important physical ability tests for middle school students and the relative importance of agreeing on the main physical ability tests. The researcher considers tests with an agreement percentage ranging from 75% to 100% as acceptable for inclusion in the study.

Form for Evaluating the Skill Performance Level of Certain Composite Skills Under Study:

The researchers reviewed several references, studies, and research in the fields of measurement, evaluation, and basketball. They designed a form to evaluate the skill performance level of certain composite motor skills for the young players under study. This form was presented to a group of experts in the aforementioned fields to provide their opinions on the components of the evaluation form, including suggestions for additions, deletions, or modifications according to their scientific perspectives. The researchers considered an agreement rate of no less than 75% among the experts' opinions as acceptable. (Appendix 5)

Exploratory Study:

- The researchers conducted a series of exploratory studies to ensure:
- The scientific validity and reliability (truth and stability) of the research tools and to test the responsiveness of the research sample to the flipped learning model.
- The suitability of the applications used in implementing the program.
- The appropriateness of the composite skills for the level and abilities of the young players.
- The difficulties encountered in applying the study experiment on the young players.
- The suitability of the time allocated for implementing the program.

The results of this exploratory study showed that the proposed program was suitable for the young players in basketball**.**

Scientific Validity of Physical Abilities and Composite Motor Skills

Validity of the Special Physical Tests and Composite Motor Skills:

The researchers calculated the validity of the physical tests and composite motor skills using discriminant validity on the exploratory sample consisting of 11 players from the research population, outside the main sample. The following table shows the significance of differences between the average scores of the highest and lowest quartiles in the special physical abilities and composite motor skills under study.

Table (5)
Peripheral Comparison Between the Upper and Lower Quartiles in Special Physical Abilities and Compound Motor Skills Tests (N = 6)

Statistical Indicators	*Abilities*	*Unit of Measurement*	*Upper Quartile (N=3)*		*Lower Quartile (N=3)*		*Difference Between Means*	*t-Value*	*Significance Level*	*Reliability Coefficient*
			M	*SD*	*M*	*SD*				
Special Physical Abilities	*Sprint test with direction change (speed and flexibility)*	*Sec*	*4.22*	*0.80*	*2.82*	*0.67*	*1.4*	*4.88**	*0.01*	*0.923**
	Passing and catching test (coordination)	*attempts/sec*	*6.15*	*1.89*	*2.95*	*1.56*	*3.2*	*6.40**	*0.00*	*0.952**
	Dribbling around obstacles test (agility)	*Sec*	*5.30*	*1.96*	*3.36*	*1.87*	*1.94*	*4.32**	*0.01*	*0.928**
	Vertical jump test (explosive power)	*Sec*	*10.10*	*2.70*	*7.05*	*2.22*	*3.05*	*7.85**	*0.00*	*0.977**
	Basket shooting test (accuracy)	*attempts/cm*	*0.72*	*0.54*	*0.62*	*0.61*	*0.1*	*9.52**	*0.00*	*0.968**
Compound	*Dribbling and passing*	*degree*	*2.15*	*1.02*	*1.14*	*1.02*	*1.01*	*9.96**	*0.00*	*0.980**

	Dribbling and free shooting	*degree*	*2.12*	*1.04*	*1.11*	*0.93*	*1.01*	*8.61**	*0.00*	*0.965**
	Layup shooting	*degree*	*2.17*	*1.01*	*1.47*	*1.21*	*0.7*	*9.19**	*0.00*	*0.970**

• t-value is significant at the 0.05 level = 2.02 ***•Reliability coefficient (R) is significant at the 0.05 level = 0.812***

The table above (Table 5) shows the differences between the highest quartiles and the lowest quartiles in the physical abilities and motor skills tests for determining the reliability coefficient of the tests. Statistically significant differences were found between the two groups, with the calculated T values ranging from (4.32 to 9.96), which are greater than the table value of T at the (0.05) level. Additionally, the reliability coefficients ranged from (0.928 to 0.980), confirming that the physical abilities and composite motor skills tests measure what they are intended to measure and can distinguish between different levels.

Reliability of Physical Abilities and Composite Motor Skills Tests:

The researchers calculated the reliability coefficients for the tests using the Test-Retest method on a sample of (11) players from the study population, selected from outside the primary research sample. This was done after (3) days from the initial measurement and under the same conditions. The correlation coefficient between the first and second applications was calculated, and Table (6) illustrates this.

Table (6)

Differences Between the First and Second Applications in Physical Abilities and Motor Skills to Determine Reliability Coefficient (Using Re-Test Method) (N = 11))

Statistical Indicators	*Abilities*	*Unit of Measurement*	*First Application*		*Second Application*		*Difference Between Means*	*t-Value*	*Pearson Correlation Coefficient*
			M	*SD*	*M*	*SD*			
Special Physical Abilities	*Sprint test with direction change (speed and flexibility)*	*Sec*	*3.62*	*0.79*	*3.82*	*0.77*	*0.20*	*0.02*	*0.920**
	Passing and catching test (coordination)	*attempts/sec*	*5.85*	*1.80*	*5.95*	*1.84*	*-0.10*	*0.40*	*0.991**
	Dribbling around obstacles test (agility)	*Sec*	*5.30*	*1.96*	*5.46*	*1.90*	*0.16*	*0.06*	*0.889**
	Vertical jump test (explosive power)	*Sec*	*9.10*	*2.70*	*8.05*	*2.52*	*0.95*	*0.18*	*0.931**
	Basket shooting test (accuracy)	*attempts/cm*	*0.70*	*0.54*	*0.72*	*0.61*	*0.02*	*0.07*	*0.935**
Compound Motor Skills	*Dribbling and passing*	*degree*	*2.13*	*1.01*	*2.34*	*1.08*	*0.29*	*0.07*	*0.946**
	Dribbling and free shooting	*degree*	*4.20*	*0.81*	*4.42*	*0.87*	*0.22*	*0.06*	*0.894**
	Layup shooting	*degree*	*6.45*	*1.89*	*6.95*	*1.56*	*0.50*	*0.33*	*0.752**

• t-value is significant at the 0.05 level = 2.22 ***•Reliability coefficient (R) is significant at the 0.05 level = 0.575***

From Table (6), which presents the differences between the first and second applications of the physical abilities and composite motor skills tests to determine the reliability coefficient, it is clear that no statistically significant differences were found between the two applications. The calculated T value was lower than the table value of T at the (0.05) level = (2.23). Additionally, the reliability coefficients ranged from (0.702 to 0.996), confirming that the tests are reliable and yield consistent results when re-administered under the same conditions to the same sample.

Design and Implementation of the Proposed Program Using Flipped Learning Attachment (6)

Proposed Flipped Learning Program:

The researchers in the following section outline the steps taken to prepare the study program in order to arrive at the general components of the program, such as its main and sub-objectives, content, activities, how they are presented, as well as the procedures followed in its implementation on the research sample and how to assess their performance.

Based on what has been indicated in the scientific references, related studies, field experiences, and considering the characteristics of the research sample, the researchers designed the program according to the following steps:

First: Program Goal:

- **Overall Goal:** The researchers developed the proposed flipped learning program with the aim of improving certain special physical abilities and composite skills for basketball juniors.
- **Sub-goals:** In the framework of the overall goal of the program and reviewing the scientific frameworks, the sub-goals of the program are as follows:
  - Development of special physical abilities for basketball juniors (muscular strength, agility, accuracy, speed, flexibility, and coordination).
  - Development of composite skills for basketball juniors (dribbling and passing, dribbling and shooting, and shooting in a ladder).

Second: Program Preparation Steps:

In preparing this program, the researchers carried out the following steps:

1. Reviewed many previous studies that focused on the preparation of motor education programs in physical education and kindergartens to benefit from previous experiences in program design.
2. Analyzed the theoretical background that focused on composite basketball skills and their nature.
3. Based on the characteristics and motor and physical needs of the juniors, the researchers designed the program units to meet these needs while also developing composite basketball skills for the juniors.
4. Consulted scientific references (1), (2), (3), (9), (10), and (17) to determine the method for selecting content related to games, skills, and physical abilities.
5. Reviewed previous studies and analyzed the theoretical background to define the sub-processes related to special physical abilities and composite basketball skills in order to focus the program activities on these processes.
6. Determined the methods, techniques, activities, and skills used to develop the special physical abilities and composite basketball skills.
7. Benefited from different approaches to address the deficiencies in the juniors' special physical abilities and composite basketball skills.
8. Determined the number of appropriate activities and the number of activities per unit, as well as the number of units needed to address the deficiencies in physical abilities and composite basketball skills by reviewing previous studies and consulting experts.

Program Features:

The proposed program was designed to meet the following characteristics:

- Ease of understanding and implementation
- Variety of physical and motor activities
- Flexibility
- Progression from easy to difficult
- Continuity and sequence in content

Program Content Organization:

The content was organized into 12 educational units, with 3 units each week, lasting 90 minutes per unit. The unit is divided as follows:

- Warm-up: 10 minutes
- Physical preparation: 20 minutes
- Activity presentation: 5 minutes
- Activity execution: 50 minutes
- Conclusion: 5 minutes

Tools and Resources Used in Implementation:

The program included a variety of tools with different shapes, sizes, and colors, such as:

- Balls
- Hoops
- Ropes
- Flying discs
- Baskets and shooting hoops
- Basketballs
- Telegram platform

Program Duration:

To implement the program using the flipped learning approach, the researchers followed the following procedures:

1. **Pre-measurement:** The pre-measurement for the experimental group was conducted between 30/10/2024 and 13/10/2024.
2. **Program Implementation:**
   - The researchers applied the core study program to the juniors in the experimental group, consisting of 12 units containing remedial activities for special physical abilities and composite skills in basketball between 1/11/2024 and 30/11/2024.
   - After completing the program, post-tests for special physical abilities and composite basketball skills were applied to the experimental group to assess the effect of the training program on the development of physical abilities and composite skills.
3. **Post-measurement:** The post-measurement was carried out under the same conditions as the pre-measurement on 1 and 2/12/2024.

Statistical Treatments:

Statistical treatments were applied using SPSS version 20, including the following:

- Mean
- Standard deviation
- Median
- Skewness

- Kurtosis
- Paired Samples T-test for pre- and post-measurements
- T-test for between-group measurements
- Percentage of improvement
- Eta square
- Chi-square

Improvement Percentage Equation:

The improvement percentage was calculated using the following formula:
Improvement Percentage=Post-Measurement−Pre-MeasurementPre-Measurement×100\text {Improvement Percentage} = \frac{\text{Post-Measurement} - \text{Pre-Measurement}}{\text{Pre-Measurement}} \times 100Improvement Percentage=Pre-MeasurementPost-Measurement−Pre-Measurement×100

Presentation and Discussion of Study Results

First: Presentation of the First Hypothesis Results:

Hypothesis: There are statistically significant differences between the pre-test and post-test in the special physical abilities and composite motor skills of the basketball juniors in the control group.

Table (7)

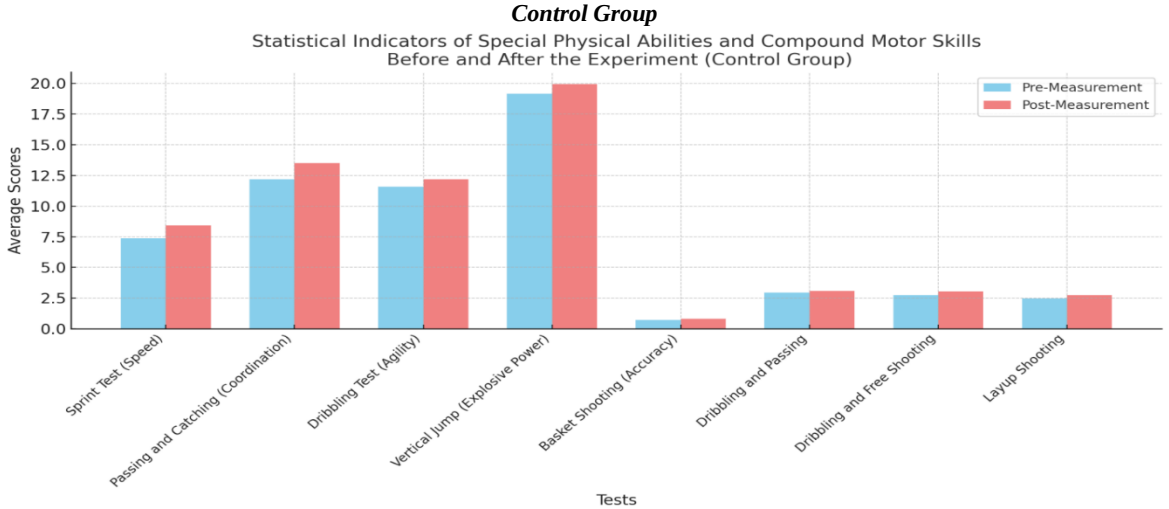
Significance of Differences Between Pre- and Post-Measurement for the Control Group in Special Physical Abilities and Compound Motor Skills (N = 20)

Statistical Indicators	*Abilities*	*First Application*		*Second Application*		*Difference Between Means*		*t-Value*	*Improvement Percentage (%)*
		M	*SD*	*M*	*SD*	*M*	*SD*		
Special Physical Abilities	*Sprint test with direction change (speed and flexibility)*	*7.39*	*0.83*	*8.45*	*0.89*	*1.06*	*0.06*	*1.35*	*14.34*
	Passing and catching test (coordination)	*12.20*	*2.14*	*13.52*	*2.12*	*1.32*	*-0.02*	*1.60*	*10.82*
	Dribbling around obstacles test (agility)	*11.57*	*2.68*	*12.20*	*2.58*	*0.63*	*-0.10*	*1.32*	*5.45*
	Vertical jump test (explosive power)	*19.18*	*4.69*	*19.94*	*4.76*	*0.76*	*0.07*	*0.96*	*3.96*
	Basket shooting test (accuracy)	*0.72*	*0.86*	*0.81*	*0.79*	*0.09*	*-0.07*	*0.99*	*12.50*
Compound Motor Skills	*Dribbling and passing*	*2.94*	*1.16*	*3.10*	*1.33*	*0.16*	*0.17*	*1.45*	*5.44*
	Dribbling and free shooting	*2.76*	*1.12*	*3.05*	*1.14*	*0.29*	*0.02*	*1.23*	*10.51*
	Layup shooting	*2.48*	*1.11*	*2.76*	*0.85*	*0.28*	*-0.26*	*0.91*	*11.29*

•The critical t-value at the 0.05 significance level = 2.09

Figure (1)

Statistical Significance of Special Physical Abilities and Composite Motor Skills Pre- and Post-Experiment for the Control Group



Discussion of Results:

From Table (7) and Figure (1), which present the statistical significance of differences between the pre-test and post-test for special physical abilities and composite motor skills in the control group, it is clear that there were no statistically significant differences at the 0.05 level. The calculated T-values ranged from 0.91 to 1.60, which are smaller than the table value (T = 2.09) at a significance level of 0.05. Thus, the results did not show any significant improvements in the special physical abilities and composite motor skills for the control group.

However, improvement percentages for all variables ranged from 3.96% to 14.34%, with the post-test measurements being higher than the pre-test. This indicates that while there was an improvement, it was not statistically significant.

Second: Presentation of the Second Hypothesis Results:

Hypothesis: There are statistically significant differences between the pre-test and post-test in the special physical abilities and composite motor skills of the basketball juniors in the experimental group.

Table (8)

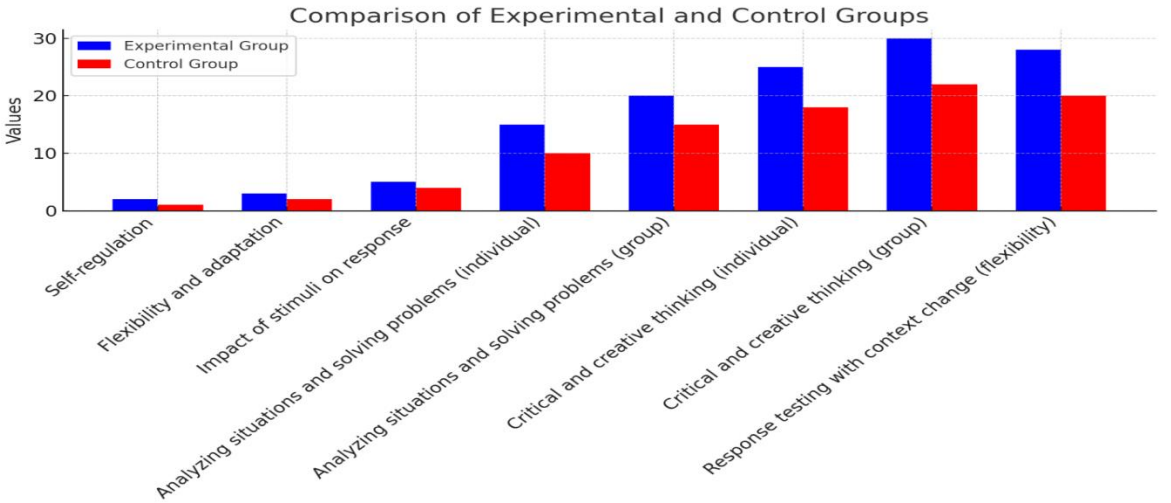
Significance of Differences Between Pre-Test and Post-Test for the Experimental Group in Special Physical Abilities and Complex Motor Skills

Statistical Indicators	*Tests*	*Pre-Test (Mean)*	*Pre-Test (SD)*	*Post-Test (Mean)*	*Post-Test (SD)*	*Difference Between Means*	*t-Value*	*Significance Level*	*Improvement Percentage (%)*
Special Physical Abilities	*Sprint test with direction change (speed and flexibility)*	*7.20*	*0.80*	*11.45*	*0.88*	*4.25*	*3.38**	*0.02*	*59.03*
	Passing and catching test (coordination)	*12.11*	*2.04*	*18.97*	*2.11*	*6.86*	*3.89**	*0.00*	*56.65*
	Dribbling around obstacles test (agility)	*11.27*	*2.66*	*17.88*	*2.65*	*6.61*	*7.15**	*0.00*	*58.65*
	Vertical jump test (explosive power)	*19.08*	*4.53*	*28.11*	*4.47*	*9.03*	*4.98**	*0.00*	*47.33*
	Basket shooting test (accuracy)	*0.69*	*0.80*	*1.24*	*0.78*	*0.55*	*4.26**	*0.01*	*79.71*
Compound Motor Skills	*Dribbling and passing*	*2.90*	*1.05*	*4.78*	*1.11*	*1.88*	*3.37**	*0.02*	*64.83*
	Dribbling and free shooting	*2.70*	*1.03*	*4.98*	*1.06*	*2.28*	*3.86**	*0.01*	*84.44*
	Layup shooting	*2.40*	*1.02*	*3.9*	*0.98*	*1.5*	*6.89**	*0.00*	*62.50*

•The T value is significant at the 0.05 level (T table value = 2.09)

Figure (2)

Statistical Significance of Differences in Special Physical Abilities and Composite Motor Skills Pre- and Post-Experiment for the Experimental Group



Discussion of Results:

From Table (8) and Figure (2), it is evident that there are statistically significant differences between the pre-test and post-test in special physical abilities and composite motor skills for the experimental group, with values of calculated T ranging from 3.37 to 7.15, which are greater than the table value (T = 2.09) at a significance level of 0.05. This indicates a significant improvement in the experimental group.

The improvement percentages for all variables ranged from 47.33% to 84.44%, with the post-test scores being significantly higher than the pre-test scores. These improvements are particularly noticeable in tests for shooting accuracy (79.71%), dribbling and free throwing (84.44%), and dribbling agility (58.65%).

The results suggest that the implementation of the proposed flipped learning program had a positive and significant impact on improving the physical abilities and composite motor skills of the basketball juniors in the experimental group

Third: Presentation of the Third Hypothesis Results:

Hypothesis: There are statistically significant differences between the experimental and control groups in the post-test scores for special physical abilities and composite motor skills of the basketball juniors

Table (9)

Significance of the differences between the post-test measurements of the experimental group and the control group in specific physical abilities and complex motor skills. N = 20

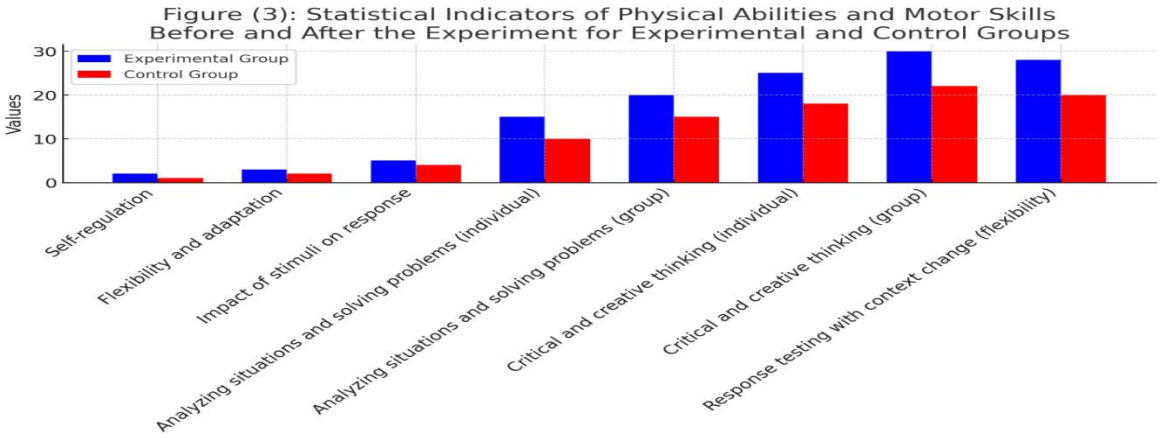
Tests	*Experimental Group Mean (M)*	*Experimental Group Standard Deviation (SD)*	*Control Group Mean (M)*	*Control Group Standard Deviation (SD)*	*Difference Between Means (M)*	*Significance Level*	*Tests*	*Experimental Group Mean (M)*
Specific Physical Abilities								
Sprint with Direction Change (Speed Test)	***11.45***	***0.88***	***8.45***	***0.89***	***3.00***	***-0.01***	***2.33****	***35.50***
Ball Passing and Catching Test (Coordination)	***18.97***	***2.11***	***13.52***	***2.12***	***5.45***	***0.01***	***2.86****	***40.31***

Dribbling Around Obstacles Test (Agility)	***17.88***	***2.65***	***12.20***	***2.58***	***5.68***	***0.07***	***6.05****	***46.56***
Vertical Jump Test (Explosive Strength)	***28.11***	***4.47***	***19.94***	***4.76***	***8.17***	***-0.29***	***3.97****	***40.97***
Basketball Shooting Test (Accuracy)	***1.24***	***0.78***	***0.81***	***0.79***	***0.43***	***0.01***	***3.16****	***53.09***
Complex Motor Skills								
Dribbling and passing	***4.78***	***1.11***	***3.10***	***1.33***	***1.68***	***-0.22***	***2.34****	***54.19***
Dribbling and Free Throwing	***4.98***	***1.06***	***3.05***	***1.14***	***1.93***	***-0.08***	***2.81****	***63.28***
Set Shooting Test	***3.90***	***0.98***	***2.76***	***0.85***	***1.14***	***0.13***	***6.05****	***41.30***

•The T-table value is significant at the 0.05 level = (2.09)

Figure (3)

Statistical Significance of Differences in Special Physical Abilities and Composite Motor Skills Post-Experiment for the Experimental and Control Groups



Discussion of Results:

From Table (9) and Figure (3), it is clear that there are statistically significant differences between the post-test results of the experimental and control groups in both special physical abilities and composite motor skills, with calculated T-values ranging from 2.34 to 6.05, all of which are greater than the table value (T = 2.09) at a significance level of 0.05. This indicates that the experimental group showed significant improvement over the control group.

The improvement percentages for all variables ranged from 35.50% to 63.28%, with the experimental group showing higher improvements across all tests. For example, the experimental group demonstrated significant gains in the dribbling and free throwing test (63.28%) and the dribbling agility test (46.56%).

These results indicate that the experimental group benefited significantly from the training program, particularly in the areas of motor skill development and physical abilities, compared to the control group.

Effect Size:

Table (10)

significance of the effect size of specific physical abilities and composite fundamental skills for the experimental and control groups according to Cohen's formulas.

Skills	*T-value*	*Significance Level*	*Eta² (Effect Size)*	*Effect Size*	*Effect Size Interpretation*
Specific Physical Abilities					
Sprint with Direction Change (Speed Test)	**5.83**	**0.00**	**0.50**	**0.9**	**High**
Ball Passing and Catching Test (Coordination)	**2.55**	**0.02**	**0.16**	**0.5**	**Medium**
Dribbling Around Obstacles Test (Agility)	**2.12**	**0.04**	**0.12**	**0.5**	**Medium**
Vertical Jump Test (Explosive Strength)	**4.23**	**0.00**	**0.33**	**0.6**	**Medium**
Basketball Shooting Test (Accuracy)	**3.34**	**0.01**	**0.38**	**0.5**	**Medium**
Complex Motor Skills					
Dribbling and passing	**2.38**	**0.03**	**0.13**	**0.5**	**Medium**
Dribbling and Free Throwing	**4.17**	**0.00**	**0.22**	**0.6**	**Medium**
Set Shooting Test	**5.32**	**0.01**	**0.12**	**0.8**	**High**

Effect Size Interpretation:
•0.2: Low
•0.5: Medium
•0.8: High

From Table (10), the effect sizes for the special physical abilities and motor skills ranged from medium to high, with values between 0.5 and 0.9. This indicates that the experimental group showed a substantial effect from the intervention in all measured skills. The sprint test and shooting in the ladder showed a high effect size, while other tests exhibited medium effect sizes, confirming the effectiveness of the experimental program.

Discussion of Results for the First Hypothesis:

The first hypothesis states: "There are statistically significant differences between the pre-test and post-test measurements in special physical abilities and composite motor skills for the control group basketball juniors."

Results: From Table (7) and Figure (1), it is clear that there are no statistically significant differences between the pre-test and post-test scores for the control group in the special physical abilities and composite motor skills, with T-values ranging from 0.91 to 1.60, which are smaller than the table value (T = 2.09) at a significance level of 0.05. The improvement percentages for all variables ranged from 3.96% to 14.34% in favor of the post-test.

Explanation: The researchers attribute these results to the traditional training methods used with the control group. Given the young age of the participants and the nature of the skills being complex, the traditional approach of demonstration and explanation may not have effectively fostered proper skill formation. The lack of a systematic and well-organized progression of motor skill development could have led to weaker performance. This finding aligns with studies by Esraa Abdel Aal (2023) and Safaa Ghazi (2022), which argue that neglecting the sequencing and linking of skills in traditional training can result in suboptimal performance.

Discussion of Results for the Second Hypothesis:

The second hypothesis states: "There are statistically significant differences between the pre-test and post-test measurements in special physical abilities and composite motor skills for the experimental group basketball juniors."

Results: From Table (8) and Figure (2), it is evident that there are statistically significant differences between the pre-test and post-test scores for the experimental group in the special physical abilities and composite motor skills. The T-values ranged from 3.37 to 6.89, all of which are larger than the table value (T = 2.09) at a significance level of 0.05. The improvement percentages ranged from 47.33% to 79.71%, all favoring the post-test.

Explanation: The researchers attribute the improvement in the experimental group to the effectiveness of the flipped learning program. This teaching method focuses on enhancing special physical abilities, which in turn positively impacts the performance of composite motor skills. The findings are consistent with Bergmann and Sams (2012), who note that flipped learning enhances students' understanding and interaction in educational environments, resulting in improvements in both academic and physical

performance. Further, studies by Esraa Abdel Aal (2023), Haider Abdullah and Ali Hussein (2023), and Safaa Ghazi (2022) confirm that learners taught using this method show better participation, interaction, and performance compared to traditional methods.

The researchers believe that flipped learning, as a modern educational model, offers a comfortable and open learning environment for young players, with a focus on practical application during training, leading to higher performance levels compared to traditional methods.

Discussion of Results for the Third Hypothesis:

The third hypothesis states: "There are statistically significant differences between the experimental and control groups in the post-test measurements in special physical abilities and composite motor skills for the basketball juniors."

Results: From Table (9) and Figure (3), it is clear that there are statistically significant differences between the experimental and control groups in the post-test scores for special physical abilities and composite motor skills, with T-values ranging from 2.81 to 6.05, all of which are greater than the table value (T = 2.09) at a significance level of 0.05. The improvement percentages for all variables ranged from 35.50% to 63.28%, all favoring the experimental group.

Explanation: The researchers attribute the differences to the flipped learning program, which proved to be more effective in improving both physical abilities and motor skills compared to the traditional methods used with the control group. The higher improvement percentages in the experimental group suggest the program's positive impact. According to Hung (2015), flipped learning contributes to the development of students' physical and cognitive abilities by focusing on practical activities and interactive discussions. Similarly, Talbert (2017) argues that dedicating training sessions to practical activities, rather than theoretical explanations, enhances students' physical performance. This approach creates an interactive training environment where players can apply the skills they have acquired, leading to overall improvement in both physical and motor skills.

Further, Bishop and Verleger (2013) suggest that flipped learning offers tangible educational benefits, with trainees showing significant improvement in performance when interactive technologies are integrated into the training process.

Conclusions:

In conclusion, the flipped learning program had a significant positive effect on improving both special physical abilities and composite motor skills in the experimental group, with marked differences compared to the control group, which relied on traditional methods. The results support the effectiveness of flipped learning as a modern teaching model, particularly in improving the physical and motor skill performance of young basketball players.

Based on the objectives, hypotheses, and results of this research, the researchers have drawn the following conclusions:

1. The special physical abilities and composite motor skills of the basketball juniors in the experimental group showed significant improvement compared to the control group in the post-test measurements, as a result of using the flipped learning model.
2. The performance of composite motor skills in the experimental group improved significantly over the control group in the post-test, due to the positive effects of flipped learning.
3. The use of flipped learning led to a significant improvement in the special physical abilities of the basketball juniors in the experimental group.

Recommendations:

In light of the research sample and objectives, and based on the results obtained, the researchers recommend the following:

1. Implement the proposed flipped learning program for developing special physical abilities and performing composite motor skills in basketball for juniors, as it has a positive and effective impact on improving skill performance for the juniors at the College of Physical Education.
2. Conduct similar studies using flipped learning for other skills in basketball and other sports to explore its broader applicability and benefits.

References:

Arabic References:

1. **Esraa Abdel Aal (2023):** "The impact of the flipped learning strategy on learning some basic skills in gymnastics for physical education students," Banha Journal of Human Sciences, Issue 2, Part 3.
2. **Safaa Ghazi Mohamed (2022):** "The impact of flipped learning on some learning outcomes in gymnastics," Beni Suef Journal of Physical Education and Sports Sciences, Volume 5, Issue 9, pp. 323-353.
3. **Haider Abdullah, Ali Hussein (2023):** "The effect of flipped learning using the classroom platform in learning some gymnastics skills," European Journal of Sport Sciences Technology, Volume 1, Issue 46, pp. 122-140.

Foreign References:

4. **Bergmann, J., & Sams, A. (2012):** Flip Your Classroom: Reach Every Student in Every Class Every Day, International Society for Technology in Education.
5. **Bishop, J. L., & Verleger, M. A. (2013):** "The flipped classroom: A survey of the research," ASEE National Conference Proceedings, Atlanta, GA, Volume 30, No. 9, pp. 1-18.

6. **Chen, H. L., & Chen, N. S. (2014):**"Design and evaluation of a flipped course adopting the holistic flipped classroom approach," Journal of Educational Technology & Society, 17(2), 289-297.
7. **Davies, R. S., Dean, D. L., & Ball, N. (2013):** "Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course," Educational Technology Research and Development, 61(4), 563-580.
8. **García-Alonso, M., Ruiz-Jiménez, J. M., & Guevara-Otero, R. (2023):**"Evaluating face-to-face and online flipped learning on performance and satisfaction in marketing and communication students," Contemporary Educational Technology, 16(1), ep490. https://doi.org/10.30935/cedtech.12649.
9. **Hao, L., Tian, K., Salleh, U. K. M., Chin, H. L., Ge, S., & Cheng, X. (2024):**"The effect of project-based learning and project-based flipped classroom on critical thinking and creativity for business English course at higher vocational colleges," Malaysian Journal of Learning & Instruction, 21(1), 159–190. https://doi.org/10.32890/mjli2024.21.1.6.
10. **Hung, H. (2015):**"Flipping the classroom for English language learners to foster active learning," Computer Assisted Language Learning, 28(1), 81-96.
11. **Irianti, L., Faridi, A., Pratama, H., & Suwandi, N. (2024):** "Flipped classroom and critical thinking on public speaking class," Cogent Education, 11(1). https://doi.org/10.1080/2331186x.2024.2315815.
12. **Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014):** "The experience of three flipped classrooms in an urban university: An exploration of design."
13. **Lage, M. J., Platt, G. J., & Treglia, M. (2000):** "Inverting the classroom: A gateway to creating an inclusive learning environment," The Journal of Economic Education, 31(1), 30-43.
14. **O'Flaherty, J., & Phillips, C. (2015):** "The use of flipped classrooms in higher education: A scoping review," The Internet and Higher Education, 25, 85-95.
15. **Talbert, R. (2017):** Flipped Learning: A Guide for Higher Education Faculty, Stylus Publishing.
16. **Van Vliet, E. A., Winnips, J. C., & Brouwer, N. (2015):** "Flipped-class pedagogy enhances student metacognition and collaborative-learning strategies in higher education but effect does not persist," CBE—Life Sciences Education, 14(3), ar26.
17. **Zatsiorsky, V. M., & Kraemer, W. J. (2006):** Science and Practice of Strength Training, Human Kinetics.