

The Impact of Proposed Educational Exercises Based on Felder and Silverman's Theory on Learning Some Basic Basketball Skills for Female Students

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Abstract

The first chapter includes the introduction and importance of the research. Learning constitutes an essential part of individuals' and societies' lives, leading to the establishment of specialized institutions to manage, organize, and direct it, avoiding randomness and chance in this vital process. Given the importance of learning in various aspects of life, it has garnered extensive attention from different groups. Researchers have been particularly interested in finding innovative solutions to improve students' performance. One such solution is the Felder and Silverman Theory, which takes into account different learning styles in teaching processes. According to this theory, every student has a preferred learning style for receiving and processing information.

The research problem revolves around the difficulty in learning and mastering basketball skills. Many students fail to benefit from their preferred learning styles due to teachers' reliance on traditional teaching methods. The study aims to develop educational units using exercises based on Felder and Silverman's Theory and assess their effect on learning basic basketball skills for female students.

The research methodology relies on the experimental approach. The sample was divided into two groups: the experimental group used exercises based on Felder and Silverman's Theory, while the control group followed traditional methods to compare learning outcomes.

Keywords: Felder and Silverman Theory, Basketball

Introduction

Today's world is witnessing rapid development and continuous progress in various fields of science, accompanied by an immense and accelerated spread of knowledge. Students need to adapt to this progress and participate positively in life to keep pace with this vast information flow. It is essential for learners to work diligently and systematically to choose the best alternatives and solutions that drive their societies towards advancement and enable them to catch up with civilization. Hence, it is important for students to learn how to think and analyze rather than merely memorize curriculum content without deep understanding or practical application.

In the field of sports, despite significant developments in various areas, traditional teaching methods used in educational institutions still fall short of achieving desired educational goals. This necessitates the development of methods to align with experts' and specialists' aspirations in educational and scientific programs.¹

Learning is a fundamental and ongoing process that contributes to individual and societal development. It aims to acquire knowledge, skills, and values that help individuals adapt to life's changes. Motor learning, a subset of the general educational process, plays a pivotal role in shaping learners' behaviors from birth to death. No human activity is devoid of learning or motor learning, which aligns with sports training in transferring information from the teacher or trainer to the learner or player. Motor learning involves behavioral changes resulting from the educational or training process, aiding in acquiring behavioral aspects such as running, jumping, thinking, and problem-solving.²

Felder and Silverman's Theory comprises a set of cognitive and psychological behaviors that interact consistently in a student's response to learning content. The theory includes four bipolar learning styles.

Basketball is one of the most popular and prominent sports globally, combining physical abilities, strategic thinking, and teamwork. The sport's diverse essential skills—passing, shooting, dribbling, and rebounding—present educational challenges that develop learners' physical and mental aspects.³

This research emphasizes using Felder and Silverman's Theory, an educational approach aiming to improve learning by considering students' various learning styles. By leveraging students' preferred learning styles, basketball skills can be effectively mastered through designing engaging educational programs, boosting motivation, and enhancing learning outcomes.

Research Problem

Basketball demands diverse skills and high coordination between physical and mental aspects. Many learners face challenges in acquiring these essential skills, making the learning process difficult. From the researcher's teaching experience, the primary issue lies in the weak implementation of modern methods. Many instructors rely solely on traditional teaching approaches, ignoring modern, scientifically-based techniques that cater to learners' interests and individual capabilities. The lack of variety in teaching methods leads to boredom and fails to meet students' diverse needs, whether regarding individual differences or physical abilities. This problem prompted the researcher to address it comprehensively by employing educational exercises based on Felder and Silverman's Theory to enhance the learning of basic basketball skills for female students.

Research Objectives

1. Developing educational units using exercises based on Felder and Silverman's Theory to teach basic basketball skills to female students.
2. Assessing the effect of these exercises on learning basic basketball skills among female students.

Research Hypotheses

There is a significant impact of educational exercises based on Felder and Silverman's Theory on learning basic basketball skills for female students.

Research Fields

- **Human Domain:** Second-year female students, College of Physical Education, University of Kufa.
- **Time Domain:** 15/10/2025 to 4/12/2025.

- **Location Domain:** Indoor basketball court at the college.

Research Method

The researcher adopted the experimental method, involving two equivalent groups (experimental and control) and pre-and post-tests, due to its relevance to the research problem.

Research Population and Sample

The research population comprised second-year female students from the College of Physical Education and Sports Sciences, University of Kufa, totaling 32 students. The sample included 20 randomly selected students divided into two groups: a control group (10 students) following traditional teaching methods and an experimental group (10 students) using exercises based on Felder and Silverman's Theory. Four additional students from the same population were used for exploratory studies.

Tools and Instruments Used

Data Collection Tools:

- Arabic and foreign references and sources.
- Personal interviews.
- Tests and measurements.
- Special forms for recording test results.

Equipment:

- Laptop.
- Electronic stopwatches (2).
- Plastic cones (12).
- Basketball court.
- Official basketballs (6).
- Whistles (2).
- Adhesive tape.
- Forms for recording test results.

Field Procedures

Skill Test Descriptions:

1. Dribbling Test:⁴

- **Test Name:** High dribbling with direction change between six cones over a distance of 13.5 meters, back and forth.

- **Purpose:** To measure dribbling skills around obstacles (e.g., chairs).

- **Required Tools:** Basketball, stopwatch, six chairs, and marked start/finish lines.

- **Performance Description:** The test begins with the participant standing behind the starting line, holding the basketball. Upon hearing the start signal, the participant zigzags between the chairs while dribbling. The activity is performed back and forth until crossing the finish line. The time taken is measured from the start signal to crossing the finish line after returning. Participants can practice the test before the actual trial.

- **Test Conditions:**

1. Participants may use either hand for dribbling.

2. The ball must be legally dribbled as per the rules.

3. Two attempts are allowed, and the best time is recorded.

- **Scoring:** The time taken to complete the task is recorded for each attempt, and the best time is considered.

2. Layup Shooting Test:⁵

- **Purpose:** To measure the accuracy of layup shooting skills.

- **Required Tools:** Ten official basketballs and a marker.

- **Performance Description:** The participant stands at the free-throw arc, takes a ball placed on the tester's hand, and attempts the first layup. Afterward, the participant circles around a marker placed on the arc and returns for subsequent attempts. A total of 10 attempts are made.

- **Scoring:** The number of successful layups is recorded.

3. Two-Hand Passing Test :⁶

- **Purpose:** To evaluate the performance of two-hand passing skills.

- **Required Tools:** Basketball court, stopwatch, two basketballs, measuring tape, chalk, and whistle.

- **Performance Description:** From a standing position, the participant passes the basketball from chest level with both hands to a teammate positioned 5 meters away.
- **Scoring:** Two attempts are allowed, and the best score is recorded. The total score is out of 10 points.

Pilot Study

The pilot study is a preliminary survey conducted on a small sample before starting the main research. It involved four second-year students excluded from the main experiment on Sunday, October 16, 2024, at 9:00 AM in the indoor hall. The objectives included:

- Determining the time required to implement the educational curriculum.
- Forming an understanding of the students' responses to the exercises and tests.
- Overcoming errors and obstacles that may arise during curriculum implementation.

Pre-Tests

Skill tests (dribbling, layup shooting, two-hand passing) were conducted after being reviewed by experts. The tests took place in the basketball hall on Thursday, October 17, 2024, with all necessary tools and assistants present.

Main Experiment

The educational curriculum began on Sunday, October 20, 2024, and concluded on Thursday, December 5, 2024. It included selected skills (dribbling, layup shooting, two-hand passing) and corresponding exercises tailored to sequential-whole and verbal-visual learning styles. The program comprised six weekly sessions over six weeks.

Post-Tests

Post-tests for the selected skills (dribbling, layup shooting, two-hand passing) were conducted on Monday, December 8, 2024, with all tools and assistants present.

Results

Table1. Show results of Pre- and Post-Tests for the Control Group

No.	Variables	Units of Measurement	Pre-Test		Post-Test		t-Value	
			Mean	(S)	Mean	(S)	t	Sig
1	Dribbling	Seconds	23.66	1.88	20.01	1.02	5.38	0.004
2	Shooting	Points	1.23	1.89	3.70	1.44	4.15	0.002
3	Passing	Points	3.21	1.41	4.57	1.44	3.60	0.006

Table 2. Show results of Pre- and Post-Tests for the Experimental Group

No.	Variables	Units of Measurement	Pre-Test		Post-Test		t-Value	
			Mean	(S)	Mean	(S)	t	Sig
1	Dribbling	Seconds	22.42	1.04	18.11	1.52	4.62	0.002
2	Shooting	Points	1.41	1.23	4.72	0.98	5.27	0.000
3	Passing	Points	3.82	0.87	5.92	0.82	5.01	0.000

Table 3. Show results of Post-Tests for Both Groups

No.	Variables	Units of Measurement	Pre-Test	Post-Test	Post-Test		t-Value	
			Mean	(S)	Mean	(S)	t	Sig
1	Dribbling	Seconds	20.01	1.02	18.11	1.52	4.62	0.002
2	Shooting	Points	3.70	1.44	4.72	0.98	5.27	0.000
3	Passing	Points	4.57	1.44	5.92	0.82	5.01	0.000

Discussion of Results

The results presented in Tables (1) and (2) for basic basketball skills tests reveal significant differences between the pre-tests and post-tests, favoring the post-tests for both the control and experimental groups. The researcher attributes the significant improvement in the control group to the exercises incorporated into the school's existing curriculum. However, the learning was slower and less effective compared to the experimental group. This is likely due to the school's focus on specific skills within their educational units, dedicating sufficient time for their teaching. Unlike the experimental group, the control group relied heavily on performing skills quickly without considering the principle of gradual progression in exercises to achieve comprehension.⁷ Additional opportunities for learning experiences related to motor-cognitive activities aid in the development of cognitive and motor skills. The interaction and integration of motor and cognitive abilities form what is known as motor cognition and motor-cognitive abilities.

The results displayed in Table (2) for basic basketball skills tests indicate significant differences between the pre-tests and post-tests, favoring the post-tests for the experimental group. The researcher attributes the superior performance of the

experimental group to the exercises designed based on Felder and Silverman's Theory, which provided detailed explanations of skills, opportunities for student discussions, and feedback, significantly enhancing the learning process. Feedback is a critical component of any educational process, playing a vital role in guiding learners toward refining their motor performance. By providing learners with information about their performance or actions, feedback—whether internal or external—enhances motor responses. Consequently, feedback is a powerful enabler in the learning process, serving as the learner's lifeblood.⁸

This approach also serves as a strong motivator, encouraging students to strive toward achieving their goals, leading to precise and comprehensive responses to educational objectives. Mahmoud Dawood emphasized that motivation aimed at achieving a specific goal drives learners toward effective responses. Furthermore, the use of visual methods, including presentations, diagrams, images, and charts, helps achieve the fundamental objectives of the educational curriculum.⁹

The educational tools utilized during the instructional units played a significant role in meeting the learning requirements of the students. These tools are among the most effective instruments for highlighting students' capabilities, maintaining their performance levels, and achieving better outcomes aligned with their interests and preferences. The researcher also considered individual differences among the students while delivering educational exercises, adhering to the methodologies of Felder and Silverman's Theory.¹⁰

Conclusions:

1. The proposed exercises based on Felder and Silverman's Theory positively impacted the learning of basic basketball skills among female students.
2. The results demonstrated that using the proposed exercises as a teaching method significantly contributed to acquiring basic basketball skills.
3. A notable improvement was observed in the performance of the experimental group compared to the control group, attributed to the use of these exercises.

Recommendations:

1. Emphasizing the importance of adopting the proposed exercises based on Felder and Silverman's Theory in teaching and developing basic basketball skills among students.
2. Encouraging educators in physical education faculties to design and develop exercises based on Felder and Silverman's Theory for various subjects and educational skills, given their significant impact on enhancing learning while saving time and effort for students, enabling quicker and easier comprehension of educational material.
3. Conducting similar studies for other sports, highlighting the importance of the current study, as its positive results enhance reflective thinking and the learning of basic basketball skills.

References

1. Abdel Daim, M. M., & Hassanain, M. S. (2012). Basketball: Scientific and practical foundations—Teaching, training, measurement, selection, and law. Cairo: Dar Al-Fikr Al-Arabi.
2. Issa, E. A. M. (2004). Development of a skill test battery for mini-basketball players (Master's thesis, College of Physical Education, University of Mosul).
3. Aqil, H. A. (1995). Philosophy of scientific research methods. Tripoli: Dar Ibn Kathir.
4. Shaker, N. M. (2005). Motor science: Development and motor learning facts and concepts (1st ed.). Diyala: Central Press.
5. Mahjoub, W. (2000). Training scheduling (1st ed.). Baghdad: Ministry of Education Press.
6. Perkins, K. R. S. (2010). Assessment of freshmen varsity student-athletes' learning style preferences. Auburn University.
7. Weimer, M. (2013). Learner-centered teaching: Five key changes to practice. John Wiley & Sons.
8. Nabeel Abdulkadhim Athab Diya Jalil Hussein, Mahmoud Adnan Kaeid(2024). The Effect of Breathing Techniques on Weightlifting Performance and Physical Endurance. Indian Journal of Modern Research and Reviews, 63-66.
9. Mashkoo, N. B., & Hameed, N. H. (2022). Effect of physical-kinesthetic intelligence exercises on developing motor abilities and basic skills of basketball

in female students. *SPORT TK-Revista EuroAmericana de Ciencias del Deporte*, 11-11.

10. Wang, C., Yuan, Y., & Ji, X. (2024). Effects of blended learning in physical education on university students' exercise attitudes and basketball skills: a cluster randomized controlled trial. *BMC Public Health*, 24(1), 3170.