

# The Effect of the Differentiated Learning Strategy on Acquiring Some Basic Basketball Skills among Students of the College of Physical Education and Sports Sciences

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**Abstract.** Influence of differentiated learning approach on the development of some basic basketball skills among the students of faculty physical education and sport science. A pre and post-test equivalent group design was used in the study to suit its aims and nature. The study sample were (50) students from the College of Sport Education and Physical Science, were distributed randomly into experimental group and control one. The experimental group was instructed through differentiated instruction, and the control group studied with a traditional program. The instructional intervention was administered for 8 weeks, with two teaching units per week. Student's tooling with basic basketball skills, such as dribbling, chest passing and stationary shooting among others, were measured using national standardized skill tests. Results: Arithmetic means, standard deviations and t-test were used to compare groups. After post-test measurement, analysis showed a significantly better performance of the experimental group compared to controls for all assessed skills in terms of effectiveness of differentiated learning over traditional method. These results indicate that instructional content and practice conditions tailored to individual learner differences may lead to motor learning. It is recommended that the differentiated instruction strategy serves as an effective learning approach to enhance basic basketball skills acquisition among university students. The study therefore suggests the inclusion of differentiated instructional methods to basketball skills delivery into higher institutions also continue in other sports and level of education.

**Keywords:** Differentiated learning, motor learning, basic skills, basketball, physical education, sports sciences.

## 1 INTRODUCTION

University education in colleges of physical education and sports sciences has undergone substantial development in teaching methods and instructional strategies as a result of advances in

scientific knowledge and educational theory. This development has been accompanied by a growing orientation toward modern instructional approaches that aim to enhance learning outcomes, particularly in the domain of motor learning. Traditional instructional methods that rely primarily on verbal explanation and the presentation of a single performance model are increasingly regarded as insufficient for addressing individual differences among learners, especially when teaching motor skills that require high levels of neuromuscular coordination, precision, and consistency of performance (Alali et al., 2025).

Motor learning serves as one of the crucial underpinnings of physical education and sports science (Raiola, 2017). Here it is concerned mainly with coming to understand the processes through which motor skills are acquired, refined, stabilized through structured practice and scientifically grounded training. In order to improve not only the quality of performance but also increase skill mastery levels and ultimately retain skills for longer periods, effective motor learning is crucial. Thus, the selection of instructional strategies that are compatible with the nature of the skill and characteristics of learners represents an important factor in achieving effective sustainable learning outcomes accordingly.

Basketball is a team sport distinguished by the diversity, integration, and sequential interdependence of its basic skills, such as dribbling, passing, and shooting (Ji et al., 2023). The acquisition of these skills requires teaching approaches that are flexible and responsive to individual differences in physical abilities, prior experience, and skill proficiency among students. The use of instructional methods that do not adequately account for these differences may result in weak skill acquisition, reduced learning efficiency, and a decline in students' motivation to engage actively in the learning process (Araújo & Davids, 2011).

In this regard, differentiated instruction is a new teaching model which has arisen as one of the most current instructional models for addressing educational differences, it adapts the learning process to the capacities, interests and forms of learning speed expressed by students (Goyibova et al., 2025). This approach relies on variety across activities, exercises, levels of difficulty and means of access to instructional content so that students can advance as they are able. Differentiated learning methodology is based on the belief that learners are different from one another, and thus have different levels of readiness in learning, various paces of learning and previous knowledge: these factors require that varied instructional routes be taken to bring about the best in terms of learning outcomes.

A number of research works have reported that use of varied learning approaches in sport helps the learner to achieve motor skill more efficiently as compared to imparted instructional techniques (Liu, 2023). Furthermore, such approach has been reported to increase students' activity during the learning process, maintain learner autonomy and consolidate knowledge more firmly as well (Khlaifawi et al., 2025). Accordingly, the significance of the present study lies in examining the effect of the differentiated learning strategy on acquiring some basic basketball skills among students of the College of Physical Education and Sports Sciences, given its potential role in improving university-level teaching practices and enhancing students' technical performance.

### **Research Problem**

Despite the notable development in teaching methods and instructional strategies in colleges of physical education and sports sciences, the teaching of basic basketball skills often continues to rely on traditional approaches based on verbal explanation and the demonstration of a unified performance model. Such approaches frequently overlook individual differences among students

in terms of physical abilities, skill level, and learning speed. As a result, noticeable disparities emerge in students' levels of motor skill acquisition, accompanied by weak participation among some learners and an inability to achieve the desired level of skill mastery.

In practical basketball lessons, instructors frequently observe considerable variation in students' rates of learning and performance accuracy (Abd et al., 2025). While some students are over-matched by instructional demands, others who could achieve at higher levels never have their potential developed. This variability poses a particular challenge for the educational process, as it may hinder students' motivation, engagement, and persistence in learning.

Moreover, the limited application of modern instructional strategies such as differentiated learning in teaching basic basketball skills may reduce the effectiveness of motor learning and constrain students' skill development (Radi & Hazza, 2019). Although educational literature emphasizes the importance of differentiated learning in accommodating individual differences and enhancing learning effectiveness, there remains a scarcity of experimental studies that specifically examine its impact on acquiring basic basketball skills among college students. Accordingly, the research problem of the present study is formulated in the following question: Does the differentiated learning strategy have a positive effect on acquiring some basic basketball skills among students of the College of Physical Education and Sports Sciences compared to the traditional method?

### **Research Objectives**

- 1.To design an instructional program based on the differentiated learning strategy for acquiring some basic basketball skills among students of the College of Physical Education and Sports Sciences.
- 2.To apply an instructional program based on the differentiated learning strategy to students of the College of Physical Education and Sports Sciences.
- 3.To identify the effect of the differentiated learning strategy on acquiring some basic basketball skills among students of the College of Physical Education and Sports Sciences.

### **Research Hypothesis**

There are statistically significant differences between the post-test results of the experimental and control groups in favor of the experimental group in some basic basketball skills.

### **Research Scope**

Human scope: Students of the Department of Physical Education and Sports Sciences.

Spatial scope: Wissam Al-Majd Iraqi Club.

Temporal scope: From 15/10/2024 to 20/4/2025.

### **Definition of Terms**

Differentiated Learning Strategy:

Differentiated learning strategy is an instructional approach that accounts for individual differences among learners by diversifying activities, teaching methods, and levels of difficulty, thereby contributing to improved motor skill acquisition and more effective learning.

## 2 METHOD

### Research Method:

Experimental method was used based on the nature and purposes of the problem of research and a two-group design (experimental group- control group). This design was chosen because it is suitable for investigating the influence of an independent variable (the differentiated learning method) on the development of selected basic skills in basketball in controlled conditions.

### Research Sample:

Sample The sample of the study consisted from (50) second year students enrolled in the Physical Education Department at faculty of physical fitness and sports sciences for the year (2024–2025). The sample was divided as following: experimental group (20 students), control group (20 students) pilot of 5 students and withdrew (5).

**Table 1** Distribution of the Research Sample

<b>Group</b>	<b>Number</b>
Experimental	20
Control	20
Pilot	5
Excluded	5
Total	50

In order to have homogeneity of the sample, descriptive analysis age, height and weight was made. In Table 2, the skewness coefficient of all variables is within permissible range which means that the data are normally distributed and the sample homogeneity was ensured.

**Table 2** shows the homogeneity of the sample in height, weight and age

<b>Indicators</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Coefficient of Skewness</b>
Weight (kg)	73.38	7.548	0.867
Height (cm)	168.85	5.513	0.581
Age (year)	23.53	8.833	0.431

### Instruments and Tools

The following instruments and tools were utilized to implement the research procedures and collect data: laptop computer (HP), basketballs, measuring tape, video camera, standard basketball court, stopwatch, whistle, training cones, references, standardized tests and measurements, and the Internet.

### Skill Tests Used

To assess the acquisition of basic basketball skills, the following standardized tests were employed:

#### **First: Zigzag Dribbling Test between Cones**

This drill is supposed to reflect the reaction and speed of ball control where dribbling is concerned. The student is positioned behind the start line and, when they hear a start signal, must start dribbling the basketball in a serpentine motion through five cones that are placed five feet apart from one another. The student advances up and down the floor to the far end, performing this ability at maximum speed with control of the ball, he completes when they reach the goal line.

Results are the times of however long it takes to complete the sex test recorded using a stopwatch accurate to 0.1 s with the better of two attempts being taken as an individual's score.

### **Second: Chest Pass against the Wall Test**

This is a test to determine the accuracy and velocity of the pass using passing from the chest. The student is 3 meters away from a wall with a square of dimensions  $1 \times 1$  m drawn on it. The student fills out as many chest passes within 30 seconds, trying to hit the square with an "X" in it. Only successful passes that land within the square are counted, and the total number represents the final score.

### **Third: Set Shot Test**

The purpose of the following drill is to measure shooting accuracy. The player stands at a designated spot, such as the free-throw line, and takes ten (10) jump shots directly to the basket. A point is scored for each successful shot, and total made equals final score (Schmidt & Lee, 2019).

### **Pilot Study**

The preliminary practical use of the pilot study allows for concerns during testing to be minimized or corrected well in advance of the authentic research experiment. Therefore, a pilot study was carried out on (25/11/2024) on a sample of (5) students from the research population and not included in the main sample.

### **Pre-tests**

The same basketball skill tests used in the study were applied at (02.12.2024) for pre-tests. The results of the pre-tests indicated that there was no significant difference between the experimental and control groups, which verified they were equivalent before the instructional programs.

### **Main Experiment:**

Following the completion of the pre-tests, the main experiment was conducted on the research sample with the aim of identifying the effect of the differentiated learning strategy on the acquisition of selected basic basketball skills among students of the College of Physical Education and Sports Sciences.

The experimental program was implemented over a period of eight weeks, with two instructional units per week. Each instructional unit lasted 90 minutes, resulting in a total of 16 instructional units for both the experimental and control groups.

The experimental class was instructed with a different instruction program in which educational repertory and exercises were ranked at some different levels taking into consideration that students differ from one another according to their variation in physical abilities, skill and rate of learning. This consisted of varying practice, increasing levels of difficulty over a period of time, changing performance methods and using feedback to optimize skill acquisition.

On the other hand, the control group adhered to the conventional instructional regimen based on verbal instruction and instructor demonstration mainly. The exercises and levels of functioning were standardized for all students regardless of individual difference.

To ensure experimental control, all conditions were standardized for both groups, including location, duration of instructional units, tools used, and number of repetitions. The only variable that differed between the two groups was the instructional strategy employed. Upon completion of

the instructional program, post-tests were administered using the same tests and under the same conditions as the pre-tests.

**Post-tests:**

After completing the main experiment, post-tests were conducted on the research sample to obtain accurate and reliable results. Conducting post-tests is considered one of the most important procedures for evaluating the effectiveness of an instructional or training program

The same procedures were followed in terms of time, location, tools, and testing conditions as those used in the pre-tests to control extraneous variables that could influence the results.

**Statistical Analysis**

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). The following statistical techniques were employed:

Arithmetic mean

Standard deviation

Skewness coefficient

Cronbach’s alpha

Independent and paired (t-tests)

**3 RESULT**

**Pre-tests**

The pre-tests were conducted on the research sample over two consecutive days on 02/12/2024 using the selected basic basketball skill tests. These tests were administered prior to the implementation of the instructional programs to ensure equivalence between the control and experimental groups.

**Table 3** Arithmetic Means, Standard Deviations, Calculated t Values, and Statistical Significance of the Pre-tests for the Control and Experimental Groups

Variables	Unit of Measurement	Group	Mean	Standard Deviation	Calculated t Value	Significance Value	Result
Dribbling	Time (seconds)	Control	14.80	0.216	0.589	0.452	Not significant
		Experimental	14.75	0.833			
Passing	Time (seconds)	Control	11.20	0.356	0.745	0.587	Not significant
		Experimental	11.32	0.827			
Shooting	Time (seconds)	Control	4.60	0.916	1.251	0.924	Not significant
		Experimental	4.73	0.783			

As exemplified in Table (3), t values for the all skill variables were not statistically significant at ( $p \leq 0.05$ ). This suggests that there was no significant differences between the control and experimental groups in the pre-test scores. We could say thus that the two groups are not different in terms of their fundamental basketball skills level before interventions.

**Post-test**

After the instructional programs were finished, similar to pre-tests, post-tests were given in both groups. Table 4 shows the mean scores, standard deviation & calculated value of “t” and level of significance for post-test.

**Table 4** Arithmetic Means, Standard Deviations, Calculated t Values, and Statistical Significance of the Post-tests for the Control and Experimental Groups

Variables	Unit of Measurement	Group	Mean	Standard Deviation	Calculated t Value	Significance Value	Result
Dribbling	Time (seconds)	Control	13.90	0.56	0.36	0.00	Significant
		Experimental	12.42	0.53			
Passing	Time (seconds)	Control	13.11	0.78	1.58	0.00	Significant
		Experimental	16.95	0.39			
Shooting	Time (seconds)	Control	5.97	0.84	0.26	0.00	Significant
		Experimental	8.24	0.92			

The results show, as depicted in Table (4), that there were statistically significant differences between the experimental group and control group regarding all measured basketball skills of the post-tests on level of significance of ( $p \leq 0.05$ ). These variations were recording negative in favor of the experimental group who obtained higher performance degree than that of the controlled. Enhanced performance of the experimental group could have resulted from using differentiated learning, where instructional conditions were tailored to each individual student depending on their ability, learning pace and level of competence. In the control group who received traditional teaching, they just see a significantly lower improvement in the score after test.

#### 4 DISCUSSION AND CONCLUSION

The post-test results demonstrated a clear and statistically significant advantage for the experimental group that was taught using the differentiated learning strategy compared to the control group, which was instructed through the traditional method. This differentiation emerged on all three of the generic basketball skills examined in the present study (dribble, chest pass, stationary shot). These results show that the differentiated learning topic is an effective teaching strategy to improve skill level of the students in the College of Physical Education and Sports Sciences.

The finding of better outcomes in the experiment group may be justified in terms of differential learning principles that stress creating a flexible teaching setting, reflecting learner's differences. 3 Regarding differing levels of practice, task difficulty, and modes of performance, students could be involved in learning events that corresponded to their level of ability, rate of learning, and readiness. This pedagogical flexibility likely helped to engage meaningfully with the learning tasks and enabled stepping-stones towards skill acquisition. In this regard, Tomlinson (2014) emphasized that differentiated learning enhances learning efficiency by aligning instructional content and activities with learners' needs, thereby positively influencing performance quality.

The superior performance of the experimental group in the dribbling skill can be explained by the increased opportunities for structured repetition and purposeful practice provided through differentiated instruction. These practice conditions are believed to improve neuromuscular coordination, timing of movement, and ball control. These findings support Schmidt and Lee (2019) who to have introduced that matching the practice condition to the skill of a learner is an essential factor that expedites motor learning and enhances performance accuracy.

With respect to the chest pass skill, the experimental group achieved a higher number of successful passes, which may be attributed to the use of progressively challenging exercises combined with continuous feedback. This style of instruction likely allowed players to both recognize and correct technical flaws more efficiently, leading to enhanced passing accuracy and

consistency. These findings are consistent with Rink (2010) that the tailored and learner-centered teaching methods improve learning for generic motor skills in team games, especially those more closely associated with accuracy or patterned movement.

Regarding stationary shooting performance, the experimental group also demonstrated a significant advantage over the control group. This outcome may be explained by the opportunity afforded to students to select appropriate levels of task difficulty within the differentiated learning framework. Such autonomy may have contributed to increased self-confidence, reduced performance anxiety, and greater focus during execution. These findings are in line with Magill & Anderson (2017), who concluded that adapting learning conditions to the learner's level facilitates more efficient skill acquisition and improves shooting accuracy.

In addition, the overall result of the current study is in line with recent international studies. Casey & MacPhail (2018) found that the student-centered teaching model in physical education generally brings about significant improvement in both skill performance and learning motivation compared with traditional methods of instruction. Presently, Kirk (2013) noted that varied pedagogical approaches used in physical education are among the strongest determinants to improve the motor learning outcomes amongst university students.

In short, the findings of this study offer ambulatory evidence for designing effective differentiated learning strategy in enhancing fundamental basketball skills acquisition. These results are consistent with current movements in motor learning and sport pedagogy that challenge traditional pedagogical practices focused on teacher-centered, one-size-fits-all instruction to more learner-centered strategies which account for individual differences in each child's development and learning, and prompt active involvement of the learners in their own acquisition of knowledge.

## **Conclusions**

The findings of the current study indicate that differentiated learning has a positive and significant effect on basic basketball skill acquisition of students studying physical education in the College for Physical Education and Sports Sciences compared to traditional teaching. Post-test scores on dribbling, chest passing and stationary shooting skills were significantly better among the experimental group of students that had been taught the differentiated learning strategy (indicating the effectiveness of this strategy in improving technical skill performance). The differentiated learning tactic also successfully accommodated individual differences in students, by varying activities and challenge levels, thus prompting active engagement from all participants and ensuing more effective and inclusive learning results. The use of individualized learning principles was one determinant leading to the development of improved NM coordination and MP attention, due to increased opportunities for structured practice and feedback addressing students' specific learning needs. Despite some improvement in skill performance being achieved with the traditional method of instruction, it was limited by comparison to the differentiated approach: specifically, disturbed individual differences and higher levels of skill acquisition.

## **Recommendations**

The use of differentiated teaching strategies in the training of base basketball skills in colleges of physical education and sports would be desirable, as studies suggest their potential to positively affect motor learning. Physical education teachers need to feel individually responsible for teaching through contemporary, learner-centered instructional techniques that address student heterogeneity, not just transmitting their content using traditional approaches. Further, differentiated learning approaches to teaching team sports, particularly basketball should be

incorporated into tertiary curricular and pedagogical practice, so as to promote more effective skill acquisition and a greater degree of student interest. Further research is suggested to explore the influence of differentiated learning strategies on maintaining motor skills over time in various sports and educational levels (longitudinal & comparative perspective designs). It is also necessary to conduct further training programs, courses, and practical seminars aimed at improving instructors knowledge base and technologies for implementing modern educational technologies in the educational process of physical education and sports sciences.

## 5 PRACTICAL APPLICATION

The results of this study provide immediate practical implications for teaching practice in faculties of physical/sport education. The model of Differentiated Instructional can be used in basketball teaching and training, where students are organized into various levels of learning tasks and teachers arrange the learning speed catered for all learners' differences such as students' skills, physical difference and tempo. Teachers could prepare training units where different dribbling, passing and shooting drills are applied with continuous feedback, in order to increase their levels of engagement and skills. The strategy is especially beneficial in college classes because of the variety of skill levels typically represented, so that instructors can help the weakest students to learn while simultaneously challenging the strongest ones. When differentiated instruction is available within basketball curricula, the inclusion of different learning objectives in this program provides for better motor learning outcomes while maximizing participation and safeguarding the quality of physical education practice.

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