

THE EFFECT OF USING THE SELF-QUESTIONING STRATEGY ON DEVELOPING THE LEARNING OF THE JUMP SHOT SKILL IN BASKETBALL

Omar Hamdi Abdulrahman¹, Huda Qahtan Tuamaa²

Email: dr.omarhamdi88@gmail.com

Abstract: *This study examined the effect of the self-questioning strategy on learning the basketball jump-shot skill among university students. A two-group experimental design was used. Participants were 80 fourth-year students from the College of Physical Education and Sports Sciences at the University of Anbar in 2019–2020, with 40 students in each group. The experimental group learned through self-questioning, while the control group received conventional command-style instruction. Basketball jump-shot performance was assessed before and after the instructional program, and data were analyzed using SPSS. The experimental group's mean score increased from 7.55 at pre-test to 15.07 at post-test, a gain of 7.52 points. The control group's mean score increased from 7.48 to 10.46, a gain of 2.98 points. Both within-group improvements were statistically significant ($p < .001$). At post-test, the experimental group scored higher than the control group (15.07 versus 10.46; $t = 7.086$, $p < .001$). These findings suggest that self-questioning may improve jump-shot learning more effectively than conventional instruction in this study context. The strategy encourages students to examine technique, identify errors, reflect on performance, and consider corrections. Teacher development in contemporary instructional strategies and further research across different populations and motor skills are recommended.*

Keywords: *Self-Questioning, Basketball, Jump Shot, Motor Learning*

INTRODUCTION

Use of newer teaching strategy within physical education and sports sciences have give student more chance for take active role within sporting activity. This change can see across different age along with educational level, where learning no longer focus only on teacher demonstration follow by repeated practice. Student also expect for think, make decision, understand tactic, as well as become involve within learning process. Recent review have discuss value of learner-centered instruction, tactical understanding, decision-making, also meaningful participation within physical education learning (Al Ardha et al., 2025; Breed et al., 2025). Because of this change, educator start for try different instructional strategy as well as combine teaching method with additional learning tool for make lesson more effective and increase student motivation along with engagement.

Such change become part of wider movement away from teaching practice where teacher control most of learning process. More attention now give toward student participation,

¹ Anbar General Directorate of Education, Iraq

² Faculty of Physical Education and Sports Sciences, University of Anbar, Iraq

independent thinking, inquiry, and problem-solving. Within physical education, game-centered approach have become one of approach receiving attention because student can develop movement skill while also learning how for think, understand tactic, together with make decision during activity (González-Valero et al., 2024). Compare with routine practice that mainly ask student for repeat same movement, these approach can give learner more active role during skill learning.

Self-questioning become one strategy that can use for make student more cognitively active during learning. Student ask for create question for themselves and then try for answer those question while working with learning material. Within this way, they do not only receive information from teacher, but also examine, interpret, and evaluate what they learn. Brown and Pyle (2021) introduce structured self-questioning routine that use guided activity before, during, and after learning for support comprehension and engagement. Aldossari and Aldajani (2021) also examine self-questioning among secondary-school student and find its potential for developing academic achievement as well as critical-thinking skill. These study can support use of self-questioning within education, although their finding cannot directly assume for apply toward motor-skill learning within sport.

Another possible benefit of self-questioning is its connection with metacognitive awareness. When student ask themselves question, they can check whether they understand something, notice where they have difficulty, and think about how they learn. Wu et al. (2025), for example, study questioning-based information-processing strategy within online flipped learning at higher-education level. Their finding show improvement within some area of cognitive engagement and academic performance, although effect become different depending on strategy as well as outcome being measure. This mean structured questioning can support active learning, but its usefulness still need for examine according toward specific learning situation.

Learning within physical education not only about doing movement correctly. Student also need for understand why movement perform within certain way, recognize mistake, assess their own performance, and change movement when need. For this reason, physical education teaching need for connect cognitive activity with direct movement practice. Recent work on game-centered learning also discuss combination of practical skill development, cognitive involvement, and decision-making within physical education (Al Ardha et al., 2025; González-Valero et al., 2024). At same time, no single teaching strategy can expect for work within same way for every situation because its effectiveness can depend on learning objective, learner characteristic, and type of skill.

With this situation within mind, researcher try for bring different approach into physical education and sports sciences by using teaching strategy that give student more active role during skill learning. Self-questioning choose because student encourage for think about their performance, create question, and check their own understanding during learning process. Strategy then apply toward basketball jump shot learning among university student. Most earlier study about self-questioning focus on academic achievement, comprehension, critical thinking, along with learning engagement (Aldossari & Aldajani, 2021; Brown & Pyle, 2021; Wu et al., 2025). Applying strategy toward basketball therefore give another context for examine whether it can also support practical skill acquisition within university physical education.

Through self-questioning, student expect for create their own question, examine information, and check their understanding while learning. This approach closely relate toward metacognition, where learner become aware of their own thinking and try for regulate it. When student generate question themselves, they may notice part of skill they still do not understand, check their progress, and decide whether they need more practice or further explanation. An et al. (2024) find among university student that metacognition relate toward learning

engagement, with learning strategy and learning behavior playing mediating role. Research on metacognitive question also report possible improvement within learning performance and accuracy of learner judgment about their own understanding (Contribution of Metacognitive Questions to Accuracy of Judgment of Learning in a Digital Environment, 2024). These finding give theoretical reason for applying self-questioning as way for encourage active, reflective, and self-regulated learning.

Idea of self-regulated learning give another way for explain how self-questioning work. Within this learning process, student have role for deciding what they need learn, checking their own performance, and reviewing what they already do. They may ask themselves question like “What part I still need for improve?”, “What make my last attempt become unsuccessful?”, or “What should I change within next attempt?” Question like these can help student focus more toward their own learning process. Michalsky and Bakrish (2024) find that metacognitive question use within digital learning activity could improve learning performance and also help learner make more accurate judgment about their own learning.

Same process can apply during physical education, where student need for connect their knowledge with actual body movement. Instead of only copying movement show by instructor again and again, they can think about what their body actually do while performing skill. They can notice mistake, use feedback, and then change how they perform movement. From this point of view, self-questioning become way for student reflect while they still learning motor skill.

Basketball jump shot not produce by one movement only. Player need for control body position and balance while coordinating knee, hip, arm, ball release, and follow-through. Because all these part need work together, knowing technique also become important besides having physical ability. Student need for understand movement, coordinate their body part, and make correction after seeing result of their shot. Sofyan and Budiman (2022) develop training method for basketball jump shot and stress need for organized and systematic practice. Within another study, Yousef et al. (2025) find that flipped-classroom and learning-through-play approach could improve basic basketball skill, including jump shooting, among university student.

This make student pay attention toward specific part of technique instead of simply doing same movement many time. Support for this type of structured learning also found within basketball instruction. Pratama and Kusuma (2025) report that audiovisual learning media produce better basketball shooting outcome compare with conventional instruction among junior high school student.

METHOD

The researchers selected an experimental method because it was appropriate for the research problem under investigation. This method enabled them to examine the effects of different teaching strategies on students’ basketball jump-shot learning outcomes. Previous studies have demonstrated the applicability of experimental designs in evaluating the effectiveness of instructional approaches and training methods for improving basketball shooting skills (Abady et al., 2026; Hatami & Savaş, 2024; Li et al., 2024).

Fourth-year student from morning program at College of Physical Education and Sports Sciences, University of Anbar, use as participant. They select through purposive sampling during 2019–2020 academic year. Originally, there were 90 student from Class A and Class B. Lottery then conduct for assign classes, with Class A become control group and Class B become experimental group. Ten student do not take part within pre-test and remove from sample. Therefore, 80 student remain within final sample.

Experimental Design

Study use two group within its experimental design. One group treat as experimental group and learn basketball jump shot using self-questioning strategy. Other group act as control group and receive instruction through conventional command-style teaching method.

Equipment, Instruments, and Data Collection Methods

Several type of equipment and material prepare for study. These include desktop computer, laptop, video camera, stopwatch, whistle, adhesive tape, metric measuring tape, 40 basketball, regulation basketball court, chalk, Arabic and international reference, internet resource, testing and measurement instrument, together with chair.

Basketball Jump Shot Skill Test. For assessing basketball jump shot, researcher use skill test develop by Mohammed Mahmoud and Mohammed Sobhi (1989). Purpose of the test. Test use for assess how fast and accurately participant can perform basketball jump shot.

Equipment required

Testing setup require basketball, basketball hoop, two chair, and marked line with length of 540 cm. Line place at 45-degree angle toward end line. At its end, small transverse marker measuring 45.72 cm use for identify movement area. One chair with basketball place on each side of basket, with same setup use for both side.

Test procedure

Before starting, participant sit behind one of chair. After examiner give starting signal, participant take basketball from chair along with move toward marked shooting position, which 540 cm from end line. From this position, participant perform jump shot. Test can perform by two participant at same time. Each participant use different side of basket, refer as Area A and Area B. Second participant start after first participant take first shot and then run for collect rebounded ball. Participant repeat this sequence until five shot have take from each side. Therefore, every participant complete total of ten shot during test.

Test conditions.

For every attempt, participant require for jump as well as release ball while staying behind designated marker. Once shot complete, participant have to collect ball after it rebound from basket or backboard. Participant then return toward shooting position and prepare for next attempt. Same procedure follow on both side of basket. Each participant complete five shot within Area A as well as another five shot within Area B.

Scoring procedure

Score for every shot determine based on whether ball enter basket, touch backboard or rim, or miss both.

Successful basket receive two point.

When ball touch either backboard or rim but do not enter basket, participant receive one point. If ball do not enter basket and also do not touch backboard or rim, no point given.

Field Research Procedures

Pre-Tests

First measurement conduct before teaching treatment on Tuesday, October 1, 2019. Assisting team handle testing while researcher supervise activity. Two group complete test separately, but researcher keep testing procedure and condition same for both group.

Main Experiment

Student within experimental group first receive two introductory meeting before actual instructional program. These meeting intend for make student familiar with self-questioning and prepare them for use strategy during basketball learning. These session hold on Sunday along with Tuesday, October 6 and 8, 2019. Purpose is for introduce student toward self-questioning strategy and help them understand how it will use during upcoming learning activity.

Actual experiment start on Sunday, October 13, 2019. Within total, instructional program include eight teaching unit, with two meeting hold every week on Sunday and Tuesday. Self-questioning strategy mainly use during main instructional part of each teaching unit. All teaching activity take place within indoor basketball gymnasium of College of Physical Education and Sports Sciences, University of Anbar. Student within experimental group learn through self-questioning strategy, while control group continue with conventional command-style method normally use by instructor. Program complete on Tuesday, November 5, 2019. Once they make their initial understanding, student ask for check it again. They compare what they think about each part of jump shot with what they observe during lesson. This give them chance for see which part of technique they understand correctly and which part still confusing or need further explanation.

Next part focus more directly on solving problem through question. When student face difficulty with particular part of jump shot, they encourage for think about reason behind problem and ask themselves question about it. They can then consider what might change for perform movement better. Within this way, student involve within finding their own technical problem instead of waiting for instructor identify every mistake. They then consider possible way for solve them. This allow student for take part within finding technical mistake together with choosing suitable correction instead of depend completely on instructor command. Within fourth step, student work on rebuilding and improving their understanding of skill. They return toward learning material whenever some part of movement still unclear. Strategy include activity before, during, and after student review instructional material. By doing this, they can improve their understanding of movement sequence and correct misunderstanding that appear during learning process.

Four step use for help student notice mistake within motor program involve during performing basketball jump shot. As they repeatedly observe movement, reflect on their performance, along with ask themselves question, student expect for understand correct technical sequence more clearly. This process also encourage them for become more interested and motivate within improving their own performance.

Student have active position within learning process throughout program. They not only ask for copy instructor movement or follow command. Instead, they encourage for make their own question, study technical information, observe movement carefully, and decide what procedure needed for perform jump shot correctly. During whole experimental period, researcher monitor teaching process for make sure instructional program implement as plan.

Post-Tests

After instructional program finish, post-test give toward both group on Tuesday, November 12, 2019, at around 10:00 a.m. Researcher use same testing procedure as pre-test as well as maintain similar environmental condition. This do for allow post-test result for compare with initial measurement within consistent way.

Statistical Methods

Collected data enter and analyze using SPSS.

Some part of methodology still need checking against original research record before manuscript submit for publication. This become necessary because several detail within reported procedure may create uncertainty about how study actually conduct. Sample allocation: There were 90 student at beginning and 10 student later exclude because they miss pre-test. Report should clearly state whether 10 student refer toward 10 student total from both group or 10 student from each group. This clarification need because information determine actual number of student assign toward experimental and control group. Test measurement: Basketball test describe as measuring both shooting speed and accuracy. However, scoring description only explain how point give according toward shooting result. If speed also become part of analysis, methodology need state how shooting time measure and how this

time include within final calculation. Distance and marker: Verify stated measurement of 540 cm and 45.72 cm against original test protocol. Reference: Provide complete bibliographic detail for Mohammed Mahmoud and Mohammed Sobhi (1989) for enable reader for locate original test. Experimental duration: Date indicate eight instructional unit deliver twice per week. Confirm that number as well as schedule of session match original study record.

HASIL

A Pre-Test and Post-Test Results for the Experimental and Control Groups

Table 1. Comparison of Pre-Test and Post-Test Results for the Experimental and Control Groups in the Basketball Jump Shot Skill

Group	Measure ment	N	Mean	Standard Deviation	Mean Difference	SD of Differences	t- value	Sig.
Experimental	Pre-test	40	7.55	1.362	7.70	3.532	9.021	0.000
	Post-test	40	15.07	3.152				
Control	Pre-test	40	7.48	1.139	2.98	1.753	7.082	0.000
	Post-test	40	10.46	1.843				

Note. Result indicate statistically significant difference between pre-test and post-test score within both group at 0.05 significance level. Degree of freedom for each paired comparison were $(n-1=39)$. Reported significance value of 0.000 should conventionally present as $p < .001$.

Comparison of Post-Test Results Between the Experimental and Control Groups

Table 2. Comparison of Post-Test Results Between the Experimental and Control Groups in the Basketball Jump Shot Skill

Skill Test	Group	N	Mean	Standard Deviation	t-value	Sig.
Basketball jump shot	Experimental	40	15.07	3.152	7.086	0.000
	Control	40	10.46	1.843		

Note. Reported result indicate statistically significant difference between experimental and control group at 0.05 significance level, with 78 degree of freedom. Significance value should report as $p < .001$.

DISCUSSION

Result present within Table 1 indicate that both experimental as well as control group improve their basketball jump shot performance between pre-test and post-test assessment. Experimental group mean score increase from 7.55 toward 15.07, representing mean improvement of 7.52 point. Meanwhile, control group mean score increase from 7.48 toward 10.46, representing improvement of 2.98 point. These finding suggest both instructional approach associate with improved performance, although experimental group demonstrate substantially greater increase within mean score.

Result within Table 2 further indicate that experimental group achieve higher post-test mean score than control group. Experimental group obtain mean score of 15.07, compare

with 10.46 for control group, with reported t-value of 7.086 and $p < .001$. This statistically significant difference support study hypothesis that self-questioning strategy may become more effective than conventional command-style instruction for improving student basketball jump shot performance under condition examine within this study.

Improvement of experimental group explain by researcher through several feature of self-questioning. One feature is how strategy make student recall their previous knowledge before learning new material. It also try for increase their interest and give them clearer mental direction about skill they learn.

Strategy also give student different learning role compare with conventional instruction. Within command-style lesson, student may mainly watch instructor and then try for copy demonstrate movement. With self-questioning, they have to look more carefully toward technical element and think about how different part of movement connect with each other. When problem appear, questioning and reflection can help them consider possible reason and solution. Researcher relate this explanation toward view attribute toward Ahmed Labib (2017), who describe self-questioning as way for stimulate intellectual activity and thinking skill. Magdy Aziz (2008) similarly emphasize that focused questioning may help learner understand material more deeply, become more aware about their own thinking, and develop their cognitive ability.

The improvement observed in the experimental group may be associated with students' active involvement in the learning process. Through the self-questioning strategy, students have more opportunities to observe movements carefully, evaluate their own performance, ask questions, and reflect on mistakes. Rather than treating practice as mere repetition of movements, this strategy encourages students to develop a deeper understanding of the skill being learned. These learning activities may help explain the greater improvement in basketball jump-shot performance observed in the experimental group, as reflective and self-regulated learning approaches have been associated with improvements in motor-skill learning and basketball performance (Leukel & Loibl, 2025; Najaf, 2026; Rasool, 2026). Nevertheless, these findings should be interpreted in light of the study design, sample characteristics, and instructional conditions. Although the results revealed a statistically significant difference between the groups, further research is needed to determine whether similar effects can be observed among students at different educational levels and in other sports skills.

CONCLUSION

Based on finding of study, it can conclude that use of self-questioning strategy contribute toward improving learning of basketball jump shot skill among fourth-year student at College of Physical Education and Sports Sciences, University of Anbar. This strategy encourage student for become more actively involve within learning process by generating question, formulating hypothesis and prediction, solving problem, along with observing movement technique more carefully. Furthermore, experimental group achieve higher mean score within post-test than control group, suggesting self-questioning strategy may become more effective than conventional command-style instruction for facilitating learning of basketball jump shot skill within context of this study.

REFERENCE

- Abd al-Dayem, M. M., & Hassanein, M. S. (n.d.). Measurement in basketball (1st ed.). Dar Al-Fikr Al-Arabi.
- Aldossari, A. T., & Aldajani, M. M. (2021). The effectiveness of a self-questioning strategy

- at developing academic achievement and critical-thinking skills among secondary-school students in Saudi Arabia. *International Journal of Learning, Teaching and Educational Research*, 20(8). <https://doi.org/10.26803/ijlter.20.8.17>
- Al Ardha, M. A., Kristiyandaru, A., Muhammad, H. N., Nikmah, R. A. A., Bikalawan, S. S., Indiarsa, N., Hamdani, H., & Yang, C. B. (2025). Improving physical education learning experience through Teaching Game for Understanding approach: A systematic review. *Physical Education Theory and Methodology*. <https://doi.org/10.17309/tmfv.2025.5.26>
- Al-Kaabi, K. A. Z. (2018). *Modern strategies in teaching and learning* (1st ed.). Dar Safaa for Publishing and Distribution.
- An, D., Ye, C., & Liu, S. (2024). The influence of metacognition on learning engagement: The mediating effect of learning strategy and learning behavior. *Current Psychology*, 43, 31241–31253. <https://doi.org/10.1007/s12144-024-06400-y>
- Awwad, A. L. (2017). *Teaching strategies in the twenty-first century* (2nd ed.). Dar Al-Masirah.
- Aziz, M. (2008). *Creative teaching, its techniques, and learning to think* (2nd ed.). Alam Al-Kutub.
- Abady, A. N., Siregar, F. S., Syahrudin, S., Helmi, B., Almunawar, A., & Abdullah, N. M. (2026). The effect of learning approach and hand-eye coordination level on two-point jump shot accuracy: An experimental study in basketball course. *Journal of Innovation in Educational and Cultural Research*, 7(2). <https://doi.org/10.46843/jiecr.v7i2.2991>
- Breed, R., Lindsay, R., Kittel, A., & Spittle, M. (2025). Content and quality of comparative tactical game-centered approaches in physical education: A systematic review. *Review of Educational Research*, 95(2), 293–336. <https://doi.org/10.3102/00346543241227236>
- Brown, S. A., & Pyle, N. (2021). Self-questioning strategy routine to enhance reading comprehension among secondary students. *TEACHING Exceptional Children*, 53(6), 441–449. <https://doi.org/10.1177/0040059920976677>
- Falih, A. K. (2019). *Modern strategies in education* (1st ed.). Dar Ra'id for Printing and Publishing.
- González-Valero, G., Ubago-Jiménez, J. L., Melguizo-Ibáñez, E., et al. (2024). Application of the Teaching Games for Understanding model to improve decision-making in sport learning: A systematic review and meta-analysis. *BMC Psychology*, 12, Article 781. <https://doi.org/10.1186/s40359-024-02307-2>
- Hatami, O., & Savaş, S. (2024). Comparative analysis of flipped learning versus traditional teaching methods in basketball technical instruction: Effect on students' psychomotor achievement levels. *Journal of Physical Education and Sport*, 24(6), 1507–1514. <https://doi.org/10.7752/jpes.2024.06170>
- Leukel, C., & Loibl, K. (2025). Problem-solving prior to instructional explanations when learning javelin throwing in primary school. *Instructional Science*, 53, 1511–1536. <https://doi.org/10.1007/s11251-024-09700-9>
- Li, Z., & Liu, X. (2026). Effects of blended learning on physical fitness and basketball skills of male college students: A cluster randomized controlled trial. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2026.1792646>
- Michalsky, T., & Bakrish, H. (2024). Contribution of metacognitive questions to accuracy of judgment of learning in a digital environment. *Heliyon*, 10(21), Article e40055. <https://doi.org/10.1016/j.heliyon.2024.e40055>
- Najaf, I. M. R. (2026). The effect of an educational approach based on the cognitive apprenticeship strategy on learning the skill of shooting from a jumping basketball among second-year students. *Racin Journal in the Studies of Sports Activities and*

Movement Sciences, 7(1). <https://journals.univ-msila.dz/index.php/JRSSAMS/article/view/10372>

Pratama, M. D., & Kusuma, D. W. Y. (2025). The effect of audio visual learning media towards basketball shooting outcomes learning of SMP Negeri 2 students at Kawunganten. *Indonesian Journal for Physical Education and Sport*, 6(1), 114–120. <https://doi.org/10.15294/inapes.v6i1.22167>

Radi, M. S. (2025). The effect of brainstorming strategy on the skills of jump shooting and long-range shooting in basketball among second-year students. *Wasit Journal of Sports Sciences*, 26(4), 688–704. <https://doi.org/10.31185/wjoss.1152>

Sofyan, D., & Budiman, I. A. (2022). Basketball jump shot technique design for high school athletes: Training method development. *Journal Sport Area*, 7(1). [https://doi.org/10.25299/sportarea.2022.vol7\(1\).7400](https://doi.org/10.25299/sportarea.2022.vol7(1).7400)

Wu, J., Wu, L., Yuan, H., Yang, D., et al. (2025). The influence of learning strategies on students' learning motivation, engagement, and academic performance in the context of online flipped teaching. *SAGE Open*. <https://doi.org/10.1177/21582440251336575>

Yousef, I., Kayed, M., Liftawi, S., Hamdan, S., Alnuaimi, J., & Al-Kilani, H. (2025). Impact of flipped classroom strategy and learning on the acquisition of basic skills among students in the basketball 1 course at Birzeit University. *Frontiers in Sports and Active Living*, 7, Article 1660007. <https://doi.org/10.3389/fspor.2025.1660007>.