Changes in Basketball Passing Performance Following Error-Informed Refinement of Demonstration-Based Instruction: A Two-Cycle Classroom Action Study

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Abstract: *This classroom-action study documented changes in basketball passing performance after demonstration-based instruction was refined using errors identified in the preceding cycle. Participants were 37 Grade VII H students (15 boys and 22 girls) at UPT SMP Negeri 1 Siak Hulu, Indonesia. Two cycles followed the stages of planning, action, observation, and reflection. Instruction addressed chest, bounce, and overhead passes through teacher demonstration, guided practice, observation, and corrective feedback. After Cycle I, recurring errors in target direction, arm extension, forward stepping, body posture, and visual tracking informed more focused demonstrations and movement cues in Cycle II. Performance was assessed at the end of each cycle using the same teacher-rated rubric and analysed descriptively through mean scores and classroom mastery rates. The mean score increased from 59 in Cycle I to 78 in Cycle II. The number of students meeting the school's minimum mastery criterion rose from 7 of 37 (18.92%) to 32 of 37 (86.49%), exceeding the predefined classroom target of 80%. These findings document improved immediate passing performance following the error-informed refinement of the demonstration–practice–feedback sequence. However, because the study involved one intact class without a separately reported pre-action baseline, comparison group, validated measurement evidence, or retention assessment, the findings should not be interpreted as causal evidence of long-term motor learning. The study illustrates how classroom assessment can identify recurring movement errors and guide iterative instructional decisions in school physical education.*

Keyword : *basketball passing; classroom action research; demonstration; formative assessment; physical education.*

Introduction

Developing motor competence is a central responsibility of school physical education because students require structured opportunities to understand and perform purposeful movement skills. Within basketball, passing is foundational because it maintains possession, connects teammates, and creates attacking opportunities. Successful chest, bounce, and overhead passes require coordinated posture, stepping, trunk alignment, bilateral arm action, visual orientation, timing, and directional accuracy (Carcamo-Oyarzun et al., 2025). Errors in these components can disrupt pass execution and restrict students' participation in subsequent game tasks. International evidence indicates that structured basketball instruction can support technical performance, although the outcomes depend on how explanation, demonstration, practice, and correction are organized (Wang et al., 2024; Yousef et al., 2025). Basketball passing therefore provides a relevant context for examining how teachers make complex movement information visible and actionable.

Demonstration represents a logical pedagogical response because it provides learners with an observable model of the intended movement (Namli et al., 2025). Through observation, students can identify the spatial and temporal organization of an action that may be difficult to communicate through verbal explanation alone. However, learners do not necessarily attend to the most relevant movement components merely by watching a complete demonstration (Yang et al., 2026). A systematic review found strong evidence supporting observational learning in physical education, while also showing that its value may vary according to model characteristics and the accompanying verbal cues (Han et al., 2022b). (Ste-Marie et al., 2020) similarly emphasized that observation is influenced by the model, viewing conditions, observer characteristics, and task demands. Demonstration should therefore be understood as deliberately designed observational guidance rather than a one-time presentation of an ideal technique.

Nevertheless, observation becomes instructionally meaningful only when students can reproduce the demonstrated action and receive information about their performance. Physical practice allows learners to test their movement representations, whereas feedback helps them recognize discrepancies between intended and actual execution. An updated meta-analysis found that feedback was generally associated with better motor-skill acquisition in physical education, although the authors cautioned that the cumulative evidence was not yet conclusive (Han et al., 2025). Research in secondary physical education also demonstrates that modelling, verbal information, physical practice, and feedback can be combined within authentic class conditions (Kok et al., 2020). Accordingly, contemporary skill-acquisition scholarship recommends selecting and combining instructional strategies according to learner, task, and contextual needs (Alali et al., 2024). These findings support a demonstration–practice–feedback sequence rather than treating demonstration as an independently sufficient method.

This instructional sequence becomes pedagogically responsive when assessment evidence informs subsequent teaching decisions. Recurring movement errors can reveal which components students have not yet coordinated and which cues should receive greater instructional emphasis. Assessment should therefore function not only as a mechanism for classifying achievement but also as evidence for determining the next learning strategy (Barker et al., 2025). This principle is consistent with an assessment-for-learning orientation in physical education, in which observed performance is used to adjust tasks, guidance, and feedback (Tolgfors et al., 2025; Treschman et al., 2025). In a classroom-action framework, reflection can operationalize this principle by translating the errors observed in one cycle into revised demonstrations and corrective feedback in the following cycle. Thus, assessment, demonstration, practice, and reflection form an interconnected instructional process.

Despite this theoretical rationale, a practical gap remains in explaining how such integration is enacted during regular lower-secondary basketball lessons. International studies have examined observational learning, video feedback, and broader instructional models, but their participants, motor tasks, and intervention structures vary considerably (Han et al., 2025; Kok et al., 2020). Recent basketball evidence has also predominantly examined university students within a relatively long blended-learning intervention rather than error-informed classroom-action cycles in lower-secondary education (Wang et al., 2024). Indonesian classroom studies have reported improved passing performance through game-based basketball instruction and demonstration-based football instruction (Marwansyah et al., 2023; Rahmadani et al., 2021). However, the studies reviewed here provide limited explanation of how specific movement errors are converted into revised demonstrations, attentional cues, and feedback across several basketball passing techniques. Documenting this error-to-adjustment process can therefore contribute practical instructional knowledge without claiming that one method is universally superior.

This need was evident in Grade VII H at UPT SMP Negeri 1 Siak Hulu. Preliminary classroom observation indicated that several students experienced difficulty performing chest, bounce, and overhead passes. Their recurring problems included off-target ball release, incomplete arm extension, limited forward stepping, and inconsistent visual tracking. These errors affected essential components of pass execution and contributed to many students remaining below the school's minimum mastery criterion. The observed pattern indicated that repeating the original instruction without identifying its unresolved movement components would be insufficient. Consequently, the class required an instructional response that made critical movement cues explicit and allowed subsequent teaching to be refined using evidence from students' performance.

Accordingly, this study documented changes in basketball passing performance across two classroom-action cycles after demonstration-based instruction was refined through reflection. Its contribution lies in making explicit the instructional chain connecting observed errors, revised demonstrations, guided practice, corrective feedback, and subsequent classroom performance. The study was intentionally context-specific and did not seek to establish a general causal effect or demonstrate long-term motor learning. It addressed the following research question: How did students' mean basketball passing score and classroom mastery rate change from Cycle I to

Cycle II after demonstration-based instruction was refined through classroom reflection? By answering this question, the study provides practice-based evidence concerning the iterative use of demonstration within an authentic lower-secondary physical education setting.

Method

Study Design and Research Context

This practitioner-led study employed classroom action research to improve basketball passing instruction within an authentic physical education setting. Classroom action research was selected because it enables teachers to identify an instructional problem, implement a context-specific response, observe students' performance, and refine subsequent instruction through systematic reflection (Kemmis et al., 2014; Keegan, 2016). The study was intended to evaluate improvement within one intact class rather than estimate a generalizable causal effect.

The study comprised two iterative cycles. Each cycle followed four stages: planning, action, observation, and reflection. Findings from Cycle I informed the instructional refinements implemented in Cycle II. The study was conducted during regular physical education lessons at UPT SMP Negeri 1 Siak Hulu, Indonesia. The classroom action was considered successful when at least 80% of the students met the school's minimum mastery criterion.

Participants

Participants were the 37 students enrolled in Grade VII H, comprising 15 boys and 22 girls. The intact class was included because preliminary classroom observation indicated persistent difficulties in performing chest, bounce, and overhead passes. These difficulties included off-target ball release, incomplete arm extension, limited forward stepping, and inconsistent visual tracking.

No sampling procedure was used because the study addressed an instructional problem experienced by the entire class. All 37 students participated in the instructional activities and were included in the assessments conducted at the end of both cycles. The findings are therefore specific to this class and should not be interpreted as population estimates.

Instructional Action and Cycle Procedures

The instructional action addressed three basketball passing techniques: the chest pass, bounce pass, and overhead pass. The core instructional sequence combined teacher demonstration, guided physical practice, observation of student performance, and corrective feedback.

During Cycle I, the teacher demonstrated the movement sequence for each passing technique and directed students' attention to the principal performance components. Students subsequently practised the demonstrated techniques under teacher guidance. At the end of the cycle, their performance was assessed using the basketball passing rubric. Classroom observations were also used to identify recurring movement errors.

Reflection following Cycle I identified four principal problems: passes directed away from the intended target, incomplete arm extension, failure to step forward, and inconsistent visual attention to the ball path. These observations formed the basis for planning Cycle II.

Cycle II retained the same demonstration–practice–feedback sequence but focused more explicitly on the errors identified during Cycle I. The teacher re-demonstrated the targeted movement components and emphasized upright trunk position, forward stepping, complete bilateral arm extension, visual tracking, and target-directed ball release. Corrective feedback was provided during practice using the same movement cues. Students' performance was then reassessed using the same procedures and scoring rubric applied in Cycle I.

Data Sources and Collection Procedures

Two forms of classroom evidence were collected. First, quantitative performance scores were obtained through teacher assessment of chest, bounce, and overhead passes at the end of each cycle. Second, reflective classroom observations were used to identify recurring execution problems and determine the instructional priorities for the subsequent cycle.

The observational findings were used for instructional reflection rather than quantitative comparison. Movement errors were not frequency-coded and were therefore reported as qualitative classroom evidence. The same performance rubric was used in both cycles to maintain consistency in the assessment procedure.

Basketball Passing Performance Measure

Basketball passing performance was assessed using a teacher-rated rubric adapted from a 2021 resource published by the Indonesian Ministry of Education, Culture, Research, and Technology. The rubric contained four observable performance indicators that were applied separately to the chest pass, bounce pass, and overhead pass.

Table 1. Operational structure of the basketball passing performance rubric

Performance dimension	**Observable indicator**	**Rating range**
Preparation and footwork	Ready stance, forward step, and flexed knees	1–4
Trunk position	Upright trunk during movement execution	1–4
Arm action	Bilateral arm extension during ball release	1–4

Visual orientation	Gaze directed toward the ball path or intended target	1–4

Note: *Each indicator was rated as 1 = poor, 2 = fair, 3 = good, or 4 = very good. The four indicators produced a technique score ranging from 4 to 16. Because the rubric was applied to three passing techniques, the combined raw score had a maximum of 48.*

Students were classified as meeting or not meeting the school's minimum mastery criterion. The same criterion was applied in both cycles. The instrument functioned as a classroom performance measure. Formal evidence of content validity, technique-specific rating descriptors, assessor training, and inter-rater reliability was not available for this study.

Data Analysis and Success Criterion

Data were analysed descriptively to support cycle-based instructional decision-making. For each cycle, the analysis included the mean performance score, observed minimum and maximum scores, number of students meeting the minimum mastery criterion, number not meeting the criterion, and classroom mastery rate.

Between-cycle change was expressed as the difference in mean score, number of students achieving mastery, and percentage-point change in the classroom mastery rate. The predefined criterion for completing the classroom action was a mastery rate of at least 80%. No inferential statistical tests were conducted; consequently, the findings were interpreted as descriptive within-class changes rather than statistically tested intervention effects.

Ethical Considerations

Permission to conduct the classroom action and use the resulting data for academic reporting was obtained from UPT SMP Negeri 1 Siak Hulu. The instructional activities formed part of regular physical education learning and did not expose students to procedures beyond the ordinary risks associated with classroom basketball activities. Student identities were kept confidential, and the findings were reported in aggregate form. The data were used exclusively for instructional improvement and research reporting.

Results And Discussion

Performance Outcomes across the Action Cycles

Results were reported for all 37 students in both action cycles. As presented in Table 2, the mean basketball passing score increased from 59 in Cycle I to 78 in Cycle II, representing a 19-point between-cycle increase. The number of students meeting the school's minimum mastery criterion increased from 7 students (18.92%) to 32 students (86.49%). Accordingly, the classroom mastery rate increased by 67.57 percentage points. The predefined target of at least 80% classroom mastery was not achieved in Cycle I but was exceeded in Cycle II:

Table 2. Basketball passing outcomes across the two action cycles

Outcome	Cycle I	Cycle II	Between-cycle difference
Mean passing score	59	78	+19 points
Score range	50–81	56–92	–
Students meeting the mastery criterion, n (%)	7 (18.92%)	32 (86.49%)	+25 students
Students not meeting the mastery criterion, n (%)	30 (81.08%)	5 (13.51%)	−25 students
Classroom mastery rate	18.92%	86.49%	+67.57 percentage points
Achievement of the ≥80% classroom target	Not achieved	Achieved	–

Reflective Observations across the Action Cycles

Classroom observations during Cycle I identified several recurring execution problems. These included passes directed away from the intended target, incomplete arm extension, limited forward stepping, and inconsistent visual attention to the ball's movement. The observations indicated that the demonstrated movement components had not yet been performed consistently.

These findings informed the instructional refinement implemented in Cycle II. Demonstrations and corrective feedback subsequently emphasized upright posture, forward stepping, complete arm extension, visual tracking, and target-directed ball release. Classroom observations during Cycle II indicated more consistent execution of these movement components. This qualitative improvement was accompanied by higher mean performance and classroom mastery outcomes. However, the observed movement errors were not frequency-coded and are therefore presented as reflective classroom evidence rather than quantitative outcomes.

Discussion

Interpretation of the Principal Findings

This study documented a marked descriptive improvement in basketball passing performance across the two classroom-action cycles. The mean score increased from 59 in Cycle I to 78 in Cycle II, while the classroom mastery rate rose from 18.92% to 86.49%. Consequently, the class exceeded the predefined 80% mastery target in Cycle II. Rather than treating this pattern as proof that demonstration alone caused the improvement, the findings should be interpreted in relation to the study's iterative instructional process. The movement errors identified during Cycle I were used to refine the demonstrations, practice activities, and corrective feedback implemented in Cycle II. Therefore, the most defensible interpretation is that error-informed refinement of the demonstration–practice–feedback sequence was associated with improved passing performance.

This interpretation is consistent with research on observational learning in physical education. A systematic review by Han et al., (2022) found strong evidence that observing movement models can support motor-skill learning compared with conditions without observational learning. Nevertheless, the instructional value of observation depends on how the model is presented and how the information is aligned with learner and task characteristics. Ste-Marie et al. (2020) similarly emphasized that the effectiveness of observation is influenced by the model, viewing conditions, task demands, and characteristics of the observer. In the present study, the demonstrations conducted during Cycle II were linked to specific errors involving body posture, forward stepping, arm extension, visual tracking, and target direction. This refinement may have helped students identify the movement components that required correction. Thus, the probable instructional mechanism was not exposure to a model alone, but the closer alignment between demonstration, attentional cues, physical practice, and observed performance errors.

The use of focused movement cues is also supported by evidence concerning visual instruction in children. (Sorgente et al., 2022) found that technique-focused visual instruction improved short-term precision ball-throwing performance among older primary-school children under task conditions. The authors nevertheless found that the advantage did not persist during retention testing. Although the participant age, task, and research design differed from the present study, their findings suggest that learners may benefit when visual information is restricted to a small number of relevant movement features. This provides a plausible explanation for the improvement observed after Cycle II emphasized identifiable passing components. However, because the present study did not compare different cueing strategies, the independent contribution of the movement cues cannot be determined.

Observation must also be integrated with opportunities to practise and receive meaningful feedback. Han et al., (2022a) reported that feedback generally supported motor-skill learning in physical education, with visual, corrective, and teacher-regulated feedback producing more consistent benefits than undifferentiated information. Similarly, Kok et al., (2020) demonstrated that visual feedback could be incorporated into physical education practice, although different feedback arrangements did not necessarily produce different learning outcomes. These findings indicate that feedback is most useful when it provides learners with actionable information that can be applied during subsequent attempts. In the present study, students did not merely observe the correct form. They practised the demonstrated movements and received correction concerning errors identified during performance. Accordingly, the between-cycle improvement should be associated with the complete instructional sequence—modelling, guided practice, observation, reflection, and corrective feedback—rather than with demonstration in isolation.

Beyond its motor-learning function, the instructional process illustrates the formative use of classroom assessment. The performance rubric and classroom observations were not used solely to classify students as meeting or not meeting the mastery criterion. Instead, evidence collected during Cycle I informed the instructional priorities of Cycle II. This practice is consistent with an assessment-for-learning orientation in physical education, in which teachers and learners use performance evidence to identify critical aspects of movement and determine subsequent learning strategies (Tolgfors et al., 2025). The practical contribution of the present study therefore lies in converting observable movement errors into revised instructional cues. This distinguishes the intervention from a one-directional demonstration method in which the teacher presents an ideal technique without systematically using student responses to refine instruction.

The findings also converge broadly with previous research on structured instruction in basketball and other sport skills. Wang et al. (2024) reported that a blended physical education model incorporating instructional materials, teacher demonstrations, practice, and targeted correction improved basketball outcomes among university students. At the national level, Rahmadani, Candra, Daharis, et al., (2021) documented improved basketball passing through a game-based learning model, while Marwansyah et al., (2023b) reported improved football passing and stopping following demonstration-based classroom action. Despite this convergence, direct comparisons are inappropriate because the studies differed in participant age, instructional approach, intervention duration, assessment procedures, and sport task. Collectively, however, the evidence suggests that improvement is more likely when instruction provides clear performance information, sufficient practice opportunities, and feedback responsive to learners' difficulties.

Pedagogical Implications

Taken together, the findings suggest several implications for physical education practice. First, demonstrations should highlight a limited number of observable movement cues rather than present the complete technique without directing students' attention. Second, the same cues should be maintained across demonstration, practice, feedback, and assessment so that students receive consistent information about successful performance. Third, recurring errors should inform the next instructional decision. This principle reflects a pragmatic approach to skill acquisition, in which teachers combine modelling, explanation, practice design, and feedback according to the needs that emerge during learning rather than relying on a single method as universally effective (Alali et al., 2024).

The five students who remained below the mastery criterion in Cycle II also warrant attention. Their outcomes indicate that whole-class instructional refinement was not equally sufficient for every learner. These students may require slower demonstrations, segmented practice, additional repetitions, peer-assisted learning, or individualized corrective feedback. However, because student-level data concerning attendance, previous experience, motor competence, and response to instruction were unavailable, the reasons for their continuing difficulties cannot be determined. Future classroom-action cycles should therefore document individual response patterns so that instructional differentiation can be based on evidence rather than assumptions.

Furthermore, technical proficiency in isolated passing tasks should not be treated as equivalent to competent passing during game play. Chest, bounce, and overhead passes in basketball require not only movement execution but also the ability to perceive teammates, opponents, available space, and time pressure. A constraints-led perspective emphasizes that transferable sport skills develop when learners interact with representative task and environmental demands (Renshaw & Chow, 2019). After students achieve basic technical consistency, teachers should therefore progress toward partner tasks and small-sided games that require learners to select and execute appropriate passes in changing situations. Such progression would connect technical development with perceptual and decision-making demands.

Limitations and Directions for Future Research

Several limitations define the boundaries of the findings. First, the study involved one intact class without a separately reported pre-action baseline or comparison group. Consequently, the between-cycle improvement cannot be separated from repeated practice, increasing familiarity with the assessment, or other time-related influences. Second, instructional duration and practice dosage were not documented in sufficient detail to permit precise replication. Third, the study did not report evidence concerning rubric content validity, assessor training, technique-specific scoring descriptors, or inter-rater reliability. These limitations increase uncertainty regarding measurement consistency.

In addition, only cycle-level means, score ranges, and mastery counts were available. The absence of student-level paired scores and measures of variability prevented the examination of individual response patterns and statistical uncertainty. The study also assessed performance immediately following instruction. Improved performance during or shortly after practice does not necessarily demonstrate stable motor learning, which requires evidence that change persists or transfers beyond the original practice condition (Soderstrom & Bjork, 2015). Therefore, the findings should be described as improved immediate basketball passing performance rather than confirmed long-term skill acquisition.

Future research should document the mastery threshold, score-conversion procedure, instructional duration, and number of practice opportunities. Validated technique-specific measures, multiple trained assessors, and inter-rater agreement analysis would strengthen measurement quality. Student-level paired data should also be reported to examine variation in learning responses. Finally, delayed retention tests and game-based transfer assessments are needed to determine whether improved passing performance persists and can be applied under authentic game conditions. Despite these limitations, the study provides contextually relevant evidence that classroom assessment can be used to identify movement errors and iteratively refine demonstration, practice, and feedback in school physical education.

Conclusions

This classroom-action study documented an improvement in basketball passing performance across two instructional cycles among Grade VII students. Following the refinement of demonstrations, guided practice, and corrective feedback based on the movement errors observed in Cycle I, the mean passing score increased from 59 to 78, while the classroom mastery rate rose from 18.92% to 86.49%. The principal contribution of this study does not lie in establishing demonstration as an independently superior teaching method. Rather, it illustrates how assessment evidence can be used to transform recurring movement errors into focused demonstrations, practice priorities, and actionable feedback. For physical education teachers, the findings underscore the importance of maintaining consistent movement cues across modelling, practice, feedback, and assessment. Nevertheless, because the study involved one intact class without a separate baseline, comparison group, validated measurement evidence, or retention and transfer assessments, the findings represent context-specific improvement in immediate performance rather than causal evidence of long-term motor learning. Future studies should examine this error-informed instructional sequence using stronger measurement procedures, comparison conditions, and delayed game-based assessments.

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Author Contribution

Satrio Novrandani and Leni Apriani contributed to the conceptualization and design of the study, data collection, implementation of the classroom action cycles, data analysis and interpretation, and preparation and critical revision of the manuscript. Both authors approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Conflict of Interest

The author declares that there is no conflict of interest in the research or preparation of this article.

Data Availibility

Data supporting the research findings are available to the authors and may be provided to interested parties for academic purposes upon reasonable request.

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