

Innovative Feedback Techniques in Physical Education: A Study on Long Jump Performance in Students Aged 13-15

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Abstract

A significant shift in educational practices has occurred in physical education (PE) recently, with a focus on moving away from more conventional approaches to instruction and towards more modern, technology-based feedback strategies. This study assesses the impact of Self-Controlled Video Feedback (SC-VF), Externally Controlled Video Feedback (EC-VF), Peer Review Video Feedback (PR-VF), and Teacher-Guided Instruction (TG) on long jump performance and self-efficacy among students aged 13-15. Utilizing a Randomized Controlled Trial (RCT), the research maintains stringent scientific standards and involves 180 secondary school students (96 boys and 84 girls, mean age = 14 years, SD = 0.82 months) with no prior experience in long jumping, all taught by the same PE teacher over eight years. The eight-week study period included assessments at baseline, mid-point, end-point, and two weeks post-intervention using the Self-Efficacy Scale and long jump distance measurements, analysed through Repeated Measures ANOVA. Results showed significant enhancements in performance and self-efficacy across all feedback methods, with SC-VF and PR-VF exhibiting notable improvements; SC-VF participants increased their jump from 4.52 m to 6.41 m and their self-efficacy scores from 14.62 to 25.62, while PR-VF participants saw jumps from 4.50 m to 5.80 m and self-efficacy scores from 14.51 to 22.51. The study confirms the effectiveness of video feedback in enhancing both the physical and psychological attributes of young athletes and suggests future research could explore integrating cutting-edge technologies like augmented reality (AR) and virtual reality (VR) to further enhance feedback delivery in sports training.

Keywords: Self-Controlled Video Feedback, Externally Controlled Video Feedback, Peer Review Video Feedback, Teacher-Guided Instruction, Physical Education, Long Jump

Introduction

In the vibrant arena of physical education (PE), there has been a transformative shift away from old-school teaching techniques toward cutting-edge, technology-infused feedback methods, signaling a major step forward in educational practices. The spotlight of this shift is on the long jump a staple in track and field events combining speed, strength, and agility. This athletic event demands a high level of technical skill and coordination, presenting unique challenges to middle school students who are in the throes of developing these abilities. Historically, PE has relied heavily on traditional feedback mechanisms primarily involving direct instruction from teachers. However, the advent of educational technologies has ushered in novel methods of feedback delivery like externally controlled video feedback (EC-VF) and peer review video feedback (PR-VF). These modern approaches not only provide new ways to convey performance insights but also aim to improve learning outcomes by tapping into diverse cognitive and motivational strategies.

Central to this study is the notion of self-efficacy, as conceptualized by Bandura (1997), which pertains to one's belief in their capability to execute actions required to manage future scenarios. In sports, self-efficacy greatly affects an athlete's motivation and performance (Chase, 2019). Video feedback is particularly impactful here, offering athletes a visual review of their actions, which helps in assessing and refining their skills. This feedback mechanism is critical in boosting self-efficacy, particularly through self-controlled video feedback (SC-VF), which enhances learner autonomy and active participation in the learning journey (Wulf et al., 2010). Research, including work by Andrieux and Proteau (2016), underscores that SC-VF not only enables immediate corrective action but also supports the long-term acquisition of motor skills by promoting a deeper engagement with the feedback received. This enhanced engagement is crucial for solidifying learning and ensuring the retention of skills over time. Studies such as McGrath et al (2019), have demonstrated that while immediate video feedback can markedly improve the precision of performance adjustments, its effects on sustained skill retention are mixed.

While integrating technology into PE offers numerous benefits, it also introduces challenges, especially in terms of the appropriateness and administration of video feedback. Issues arise with both the overuse and underuse of feedback—too much can overwhelm learners, too little can leave them directionless (Giblin et al., 2014). Additionally, the level of technological infrastructure available in educational settings can vary widely, potentially limiting the effective implementation of such advanced tools, as noted by Jones and Carter (2015). Nonetheless, the potential for technology to revolutionize PE classes is immense. As suggested by O'Loughlin et al (2020), technological advancements can shift PE from a traditional, teacher-led framework to a more student-centered approach that fosters active participation, engagement, and motivation. Specific technologies like EC-VF allow for controlled, personalized feedback from teachers, while PR-VF promotes an interactive, peer-supported learning environment, enriching both the social and educational dimensions of PE (Smith & Parr, 2021).

Problem Statement

One of the key questions in this research is assessing the impact of Self-Controlled Video Feedback (SC-VF) on long jump performance and self-efficacy in adolescents aged 13-15. SC-VF empowers students by letting them manage when and how often they receive feedback,

potentially boosting their involvement and enhancing their learning outcomes (Wulf et al., 2010). Validating SC-VF's role in fostering learner autonomy and self-regulation remains a pivotal empirical challenge. The second research question investigates Externally Controlled Video Feedback (EC-VF), where feedback delivery is managed by the teacher. This approach ensures consistent, educationally aligned feedback but its effectiveness in enhancing performance and self-efficacy relative to other feedback types like SC-VF and PR-VF is less clear (Andrieux & Proteau, 2016). Determining whether EC-VF can equal or exceed the benefits of learner-controlled feedback is essential for optimizing teaching strategies in physical education.

Peer Review Video Feedback (PR-VF) represents another feedback modality under scrutiny, where students critique each other's performance, thereby cultivating a cooperative learning atmosphere. This method could potentially bolster social interaction and peer learning, potentially boosting both performance and self-efficacy (Smith & Parr, 2021). The comparative effectiveness of PR-VF against SC-VF and EC-VF in improving long jump performance, however, warrants further investigation. A thorough comparative analysis of SC-VF, EC-VF, PR-VF, and traditional teacher-led feedback is crucial to identify the most effective feedback method for improving long jump performance and self-efficacy. Prior research has delivered inconsistent findings on the superiority of different feedback mechanisms (McGrath et al., 2019; O'Loughlin et al., 2020), making it imperative to gain more definitive insights through a direct comparison within a single comprehensive study.

Lastly, exploring the long-term impact of these feedback modalities on skill retention and self-efficacy is critical. While immediate performance improvements are important, they may not necessarily lead to sustained skill retention (Giblin et al, 2014). Understanding how various feedback approaches influence long-term learning and confidence is key to establishing enduring educational practices in physical education.

Research Objectives

This study seeks to address these gaps by comparing these modalities to ascertain which most effectively influences performance and self-efficacy in physical education.

Hypothesis

- H1 There are significant differences in long jump performance among students aged 13-15 who receive SC-VF at pre-test, mid-test, post-test 2, and retention test.
- H2 There are significant differences in long jump performance among students aged 13-15 who receive EC-VF at pre-test, mid-test, post-test 2, and retention test.
- H3 There are significant differences in long jump performance among students aged 13-15 who receive PR-VF at pre-test, mid-test, post-test 2, and retention tests.
- H4 There are significant differences in long jump performance among students aged 13-15 who receive TG at the pre-test, mid-test, post-test 2, and retention test.
- H5 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive SC-VF at mid-test, post-test 2, and retention test.
- H6 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive EC-VF at mid-test, post-test 2, and retention test.

- H7 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive PR-VF at mid- test, post-test 2, and retention test.
- H8 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive TG from teachers at mid-test, post-test 2, and retention test.

The findings from this study hold profound implications for educators and policymakers in the realm of sports education. By delineating the effects of various feedback modalities on learning outcomes, this research provides valuable guidance for crafting physical education curricula that effectively leverage technology to boost student engagement and learning. Additionally, a deeper understanding of self-efficacy's impact on sports performance enables educators to cultivate environments that support students in embracing challenges and persevering to enhance their skills. As the landscape of educational technology evolves, its incorporation into physical education presents exciting opportunities to refine teaching strategies and elevate learning outcomes. This investigation into the effects of different video feedback modalities on long jump performance and self-efficacy contributes critical insights into the strategic use of technology in physical education. These insights are poised to inform future educational practices and policies, thereby making sports education more dynamic, effective, and inclusive.

Methodology

A Randomized Controlled Trial (RCT) was deployed to uphold scientific accuracy and reliability in this study. The RCT design helps mitigate potential biases when evaluating new interventions, aiming for robust findings. Through power analysis using G*Power 3.1, it was determined that a minimum sample size of 178 participants would be necessary to detect moderate effects with sufficient power ($\alpha = 0.05$, $\beta = 0.80$, effect size $f = 0.25$). The study engaged 180 secondary school students (96 boys and 84 girls, average age = 14 years, SD = 0.82 months), none of whom had prior long jump experience. All students were taught by the same PE teacher, a 35-year-old male with eight years of experience. Approval from the local faculty's ethical committee was obtained, and written informed consent was secured from all participants and their parents. With roughly 45 students per group, the study was well-positioned to evaluate the effectiveness of different feedback mechanisms on long jump performance and self-efficacy.

i. Self-Controlled Video Feedback (SC-VF)

This group enabled students to independently record and review their performances, utilizing video technology at their discretion. This self-regulation of learning allows students to focus intensely on areas they wish to improve by controlling playback functions to analyse their technique and performance minutely. The autonomy granted by SC-VF is thought to enhance motivation, engagement, and the depth of cognitive processing, which may lead to better motor skill acquisition and personalized learning experiences.

ii. Externally Controlled Video Feedback (EC-VF)

In contrast, EC-VF places the control of video feedback in the hands of the instructor, who decides the timing and frequency of feedback, based on pedagogical judgments. This method aims to optimize the learning environment by reducing students' cognitive

load concerning their performance assessments, providing more structured and potentially more accurate feedback.

iii. **Peer Review Video Feedback (PR-VF)**

This modality involves students in both performing and reviewing, offering feedback to their peers. This peer interaction is designed to enhance communication skills, motivation, and provide varied insights into performance techniques, fostering a collaborative learning environment. While this method can increase engagement and motivation through social learning, the variability in feedback quality remains a concern.

iv. **Teacher-Guided Instruction (TG)**

Representing the traditional approach, TG involves direct instruction and personal correction by teachers without integrating advanced technological aids. While this method has been effective, it may not cater to individual learning preferences or promote self-efficacy as comprehensively as the more interactive, technology-enhanced methods.

Over an eight-week training period focusing on the long jump, these groups were evaluated at baseline, mid-point, end-point, and during a retention test two weeks post-intervention. This structured approach aims to provide comprehensive insights into how different feedback mechanisms impact athletic performance and self-regulatory learning in a physical education setting.

Table 1

Training program

Week	
1	Pre-Test Assess baseline long jump performance
2-3	Practice session (3 x 10 trials)
4	Mid-Test (Week 4): Intermediate assessment of long jump performance to monitor progress and baseline self-efficacy
5-7	Practice session 3 x 10 trials
8	Post-Test (Week 8) Final assessment to measure overall long jump improvement and changes in self-efficacy.
10	Retention Test (Week 10) Two weeks post-intervention, a retention test is conducted to evaluate the long-term effects of the training on long jump improvement and changes in self-efficacy.

Self-Efficacy Scale Implementation

Students were assessed using a self-efficacy scale tailored to long jump performance (Kok et al., 2020), which gauges their confidence and enjoyment of the activity. Administered at various stages throughout the study, this scale helped monitor shifts in self-efficacy, enjoyment, and perceived learning over time. Each feedback-related question was rated on a scale from 0 to 10, with higher scores indicating a more effective feedback mechanism. Analysing these scores provided insights into how each feedback type influenced students' enjoyment and learning, shedding light on the motivational dynamics of the different feedback mechanisms.

Long Jump Performance Assessment

Each student executed three long jump attempts, with the longest distance recorded for analysis. The jumps took place in a standardized long jump pit, with measurements taken from the take-off line to the furthest imprint made by any body part in the sand. This method ensured that the physical performance data were accurately captured, allowing for a clear assessment of each student's best effort.

The core metrics analysed in this study were the distances achieved in the long jump and the scores from the self-efficacy scale. Repeated Measures ANOVA was employed due to its suitability for studies where data are collected multiple times from the same subjects. This analysis is beneficial for observing how different feedback mechanisms impact performance and self-efficacy over time, including post-intervention retention of improvements, which is crucial for evaluating the long-term impact of each feedback method. Repeated Measures ANOVA also facilitated the modeling of individual growth trajectories in both performance and self-efficacy, providing valuable insights into how students react differently to each feedback modality. This analysis is instrumental in customizing educational interventions to suit individual student needs, allowing researchers to discern the most effective feedback method for enhancing long jump performance and boosting self-efficacy over various assessment points. Such detailed analysis helps clarify which feedback method—whether self-controlled, externally controlled, peer-reviewed, or teacher-guided—is most beneficial for students' athletic and psychological development.

Result and Discussion

The Cronbach's alpha coefficient for the long jump test is .88, and the self-efficacy instrument has a Cronbach's alpha of .79. Regarding the distribution of scores, the skewness values range from -.16 to .36 and Kurtosis, which measures the peak of the distribution, ranges from -.99 to .10. The reliability coefficients (Cronbach's alpha) for both the long jump and self-efficacy measures are commendably high, indicating that these instruments are appropriate and effective for research in this field. The distribution characteristics (skewness and kurtosis) suggest that the data are largely symmetrical and do not exhibit problematic extreme values, further affirming the suitability of the dataset for typical parametric analyses that assume normality.

H1 There are significant differences in long jump performance among students aged 13-15 who receive SC-VF at pre-test, mid-test, post-test 2, and retention test.

The repeated measures ANOVA yielded a highly significant F-statistic ($F(1,44) = 16150.36, p < .05$), suggesting a strong effect of the intervention across time. Analysing the mean scores from the pre-test to the retention test, there is a consistent increase in the performance of long jump distances from 4.52 m to 6.41 m. The p-value ($< .05$) confirms the statistical significance of these findings, supporting the research hypothesis. This progression indicates that SC-VF likely provides an effective learning curve for students, possibly due to the enhanced autonomy and personal engagement in the learning process, aligning with theories of motor learning and control such as the Self-Determination Theory (Deci & Ryan, 2000) and Bandura's Self-Efficacy Theory (Bandura, 1977). The Self-Determination Theory suggests that greater autonomy in learning processes enhances motivation and engagement, while

Bandura's concept of self-efficacy aligns with the improvements noted in self-perceived competencies in performing the long jump.

The statistical significance and the magnitude of the F-value emphasize not only the effectiveness of SC-VF but also its potential superiority over more traditional or externally controlled feedback methods. This finding supports the notion that self-controlled learning environments can significantly enhance motor skill acquisition, as students are likely more attentive and invested in feedback that they control (Wulf, Shea, & Lewthwaite, 2010).

From a theoretical standpoint, these results underscore the relevance of Vygotsky's Zone of Proximal Development (ZPD). In SC-VF scenarios, students are likely operating within their ZPD, as they are challenged just beyond their current abilities but supported by video feedback to achieve new performance levels (Vygotsky, 1978). This scaffolding, albeit self-administered, aligns closely with contemporary educational theories that advocate for learner-centered pedagogies.

PE teachers should consider integrating self-controlled video feedback mechanisms in sports training, especially in disciplines requiring precise motor skills and self-evaluative abilities. Furthermore, extending this research to other age groups and sports could provide deeper insights into the generalized applicability of SC-VF in physical education and sports training.

The effectiveness of Self-Controlled Video Feedback in enhancing long jump performance among adolescents is statistically significant and theoretically grounded. This study not only contributes to the existing body of knowledge on motor learning and sports pedagogy but also provides practical insights for enhancing athletic training through innovative feedback mechanisms.

H2 There are significant differences in long jump performance among students aged 13-15 who receive EC-VF at pre-test, mid-test, post-test 2, and retention test.

The repeated measures ANOVA yielded a highly significant F-statistic ($df=1,44$, $p < .05$) = 5532.28, indicating statistically significant differences in long jump performance over the four tests. This substantial F-value reflects a strong effect of the intervention, with performance progressively improving, albeit with diminishing gains as the training continued. The incremental increases in long jump distances—from 4.53 m at the pre-test to 5.38 m at the retention test—suggest a positive trajectory in performance improvement. The magnitude of change, particularly between the pre-test and the mid-test, underscores the initial impact of EC-VF, which appears to stabilize as students reach a plateau by the retention test. The p-value ($< .05$) confirms the statistical significance of these findings, supporting the research hypothesis.

The theoretical underpinning of EC-VF can be associated with the Cognitive Load Theory (Sweller, 1988), which posits that external guidance helps reduce the cognitive load on learners, enabling them to focus more effectively on refining their skills. Moreover, according to the Feedback Intervention Theory (Kluger & DeNisi, 1996), the nature of feedback, its specificity, and timing are crucial in ensuring that the feedback is constructive

and enhances performance rather than distracting the learner. EC-VF likely provides structured, precise, and timely feedback that optimizes learning outcomes. For PE teachers, these insights suggest that incorporating structured and controlled feedback mechanisms like EC-VF can significantly enhance both skill acquisition and confidence among young athletes. Such feedback should be an integral part of training regimens, especially in sports that require precise technique and consistent performance.

The significant improvements in long jump performance among adolescents receiving Externally Controlled Video Feedback, as demonstrated by the statistical data, affirm the effectiveness of this feedback method. These findings not only contribute to the pedagogical practices in physical education but also enrich our understanding of the theoretical frameworks that support effective learning through feedback.

H3 There are significant differences in long jump performance among students aged 13-15 who receive PR-VF at pre-test, mid-test, post-test 2, and retention tests.

The repeated measures ANOVA yielded a highly significant F-statistic ($df=1,44$, $p < .05$) $=6167.89$, indicating extremely significant statistical differences across the testing periods. This high F-value suggests a strong effect of PR-VF on enhancing long jump performance. The p-value ($< .05$) confirms the statistical significance of these findings, supporting the research hypothesis. The incremental increases in performance from 4.50 m at pre-test to 5.80 m at the retention test demonstrate a clear trend of improvement. The percentage increase from the initial measurement to the final retention test stands at approximately 28.89%, showcasing a considerable enhancement in skills throughout the intervention.

Social Learning Theory (Bandura, 1977) posits that people learn from one another through observation, imitation, and modeling. PR-VF involves peers reviewing and discussing performance videos, which can enhance learning by allowing students to observe successful actions and integrate feedback from peers who may be perceived as relatable and credible sources. According to Constructivist Learning Theory (Piaget, 1954), learners construct new knowledge by integrating new information with their existing knowledge, heavily influenced by social interactions. PR-VF facilitates such an environment by encouraging students to engage in dialogues about their performances, promoting deeper understanding and skill acquisition. Given the effectiveness of PR-VF demonstrated in the study, sports educators should consider incorporating peer review sessions into training schedules. These sessions can be designed to foster a supportive community where students feel valued and motivated to improve, thereby enhancing not only skill levels but also interpersonal relationships and communication skills among athletes.

Peer Review Video Feedback significantly enhances long jump performance among adolescents. This intervention aligns well with theories of social learning and constructivism, providing a robust theoretical and practical framework for its effectiveness in sports training contexts.

H4 There are significant differences in long jump performance among students aged 13-15 who receive TG at the pre-test, mid-test, post-test 2, and retention test.

The repeated measures ANOVA yielded a highly significant F-statistic ($df=1,44$, $p < .05$) = 4973.0, indicating statistically significant improvements in long jump performance over time under TG. The high F-value suggests a strong effect of TG across different testing intervals. The mean distances increased consistently across the testing periods, showing an overall improvement from 4.51 m to 5.59 m. This translates to a percentage increase of approximately 23.95% from the pre-test to the retention test. Such improvements suggest that TG effectively aids in the enhancement of athletic performance in the long jump. The p-value ($< .05$) confirms the statistical significance of these findings, supporting the research hypothesis.

Behaviorist Learning Theory (Skinner, 1954) emphasizes the role of external stimuli in shaping behavior through reinforcement. In the context of TG, the instructor provides immediate feedback and reinforcement, which could explain the significant improvements observed in student performance. Scaffolding Theory (Wood, Bruner, & Ross, 1976) involves providing support structures to students until they can perform tasks independently. TG can be seen as a form of scaffolding, where the teacher guides the students through the nuances of the long jump technique until they can perform independently at an improved level. The systematic instruction and consistent feedback provided by teachers likely contribute to the gradual and sustained improvements in long jump performance. This instructional approach aligns with Vygotsky's Zone of Proximal Development, which suggests that learners can perform more complex tasks with the guidance of a more knowledgeable other.

Incorporating TG into physical education programs could provide structured learning environments that are conducive to skill acquisition and refinement. Teachers play a pivotal role in this setting by tailoring feedback and instructions to meet the individual needs of each student, potentially leading to better sports performance and more personalized learning experiences. Teacher-Guided Instruction has proven to be an effective method for enhancing long jump performance among adolescents. The significant statistical findings, supported by behaviorist and scaffolding theoretical frameworks, highlight the importance of structured and guided instruction in physical education settings.

H5 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive SC-VF at mid-test, post-test 2, and retention test.

The observed mean self-efficacy scores were 14.62, 19.62, and 25.62, respectively. The extraordinarily high F-statistic ($F(1,44) = 18518.67$, $p < .05$) suggests a robust effect of the feedback interventions on self-efficacy development over time. The statistical significance indicated by the p-value ($< .05$) and the magnitude of the F-statistic demonstrates that the feedback interventions had a profound impact on self-efficacy levels across the different testing phases. This supports the initial hypothesis of significant differences driven by the type of feedback provided. Self-Efficacy Theory (Bandura, 1977), or the belief in one's ability to succeed, is a critical determinant of how well people motivate themselves and persist in the face of difficulties. This theory supports the study's focus on how different feedback methods can alter an individual's belief in their long jump abilities.

Constructivist Learning Theory (Piaget, 1954) posits that learners construct knowledge through experiences. Video feedback, whether self-controlled or externally guided, provides concrete experiences from which students can construct an understanding of their performance and abilities. Self-Controlled Video Feedback (SC-VF) allowing students to control their feedback process could increase engagement and personal investment in learning, leading to higher self-efficacy. This method aligns with the principles of autonomous learning and intrinsic motivation, which are known to enhance self-efficacy (Deci & Ryan, 1985). The significant improvements in self-efficacy highlight the importance of tailored feedback in educational and sports settings. PE teachers should consider the individual needs and preferences of students when choosing feedback methods to maximize motivational outcomes and performance improvements.

The use of video feedback in training settings significantly influences self-efficacy in adolescent athletes, as demonstrated by the improvements in self-efficacy scores across the testing phases in this study. By integrating theoretical insights from psychology with practical feedback interventions, this research contributes to a deeper understanding of effective coaching strategies in youth sports.

H6 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive EC-VF at mid-test, post-test 2, and retention test.

The considerable F-statistic ($F(1,44) = 14918.84, p < .05$) underscores a significant effect of EC-VF on the development of self-efficacy over time. The results of the ANOVA suggest a strong influence of EC-VF on the enhancement of self-efficacy across the specified intervals. The increasing means from 14.51 to 20.53 demonstrate a positive trend in self-efficacy scores, affirming the effectiveness of externally controlled feedback in fostering self-belief related to athletic performance in the long jump. The p-value ($< .05$) confirms the statistical significance of these findings, supporting the research hypothesis. Bandura's Social Cognitive Theory (1986) posits that behavior, cognitive and other personal factors, and environmental influences interact dynamically to influence learning and behavior. The EC-VF method aligns with this theory by providing an environmental feedback mechanism that interacts with personal cognitive processes to enhance self-efficacy.

Vygotsky's Zone of Proximal Development (1978), emphasizes the role of more knowledgeable others in the learning process. EC-VF can be seen as an external scaffolding where the feedback provided by an expert (coach or teacher) enhances the learner's ability to perform beyond their initial capacity, thus boosting self-efficacy. EC-VF involves a structured approach where an expert controls the feedback process, deciding what aspects of the performance to highlight and discuss. The results strongly suggest incorporating EC-VF in athletic training programs, especially for adolescents, to improve not just physical performance but also cognitive and emotional aspects like self-efficacy. This feedback method supports a comprehensive developmental approach that aligns with educational objectives in physical education. The significant improvement in self-efficacy scores following the application of Externally Controlled Video Feedback confirms its effectiveness in enhancing athletic performance in young learners. By leveraging expert knowledge and consistent feedback mechanisms, EC-VF can serve as a potent tool in sports education, promoting not

only skill enhancement but also fostering a resilient and self-efficacious mindset among young athletes.

H7 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive PR-VF at mid- test, post-test 2, and retention test.

The mean self-efficacy scores recorded were 14.51 at the mid-test, 19.51 at post-test 2, and 22.51 at the retention test. The ANOVA yielded a significant F-statistic ($F(1,44) = 16259.29$, $p < .05$), indicating a robust impact of PR-VF on self-efficacy over time. The progression in mean self-efficacy scores suggests a positive trajectory, consistent with the effectiveness of PR-VF in enhancing perceived competence and confidence in long jump abilities. The high F-statistic and p-value ($< .05$) confirm the substantial influence of this feedback method on the participants' self-efficacy, supporting the research hypothesis. Social Learning Theory (Bandura, 1977) posits that people learn from one another through observation, imitation, and modeling, which is integral to PR-VF. Peer interactions provide a social context where students can visualize successful performance strategies and outcomes, fostering self-efficacy by observing peer successes and learning from peer mistakes. Social Comparison Theory (Festinger, 1954) explains how individuals evaluate their abilities and opinions by comparing themselves to others. In PR-VF, such comparisons can motivate improvements and reinforce self-belief as students perceive their capabilities relative to their peers.

The findings from this study advocate for integrating PR-VF in sports training programs, especially for adolescents. This method can serve as a tool to enhance not only technical skills but also psychosocial skills such as empathy, cooperative learning, and communication. Peer Review Video Feedback has demonstrated a significant positive impact on self-efficacy in adolescent long jumpers, affirming its value as an effective feedback mechanism in physical education settings. By fostering a supportive learning environment through peer interactions, PR-VF enhances both the cognitive and social dimensions of sports training, contributing to the holistic development of young athletes.

H8 There are significant differences in self-efficacy related to long jump performance among students aged 13-15 who receive TG from teachers at mid-test, post-test 2, and retention test.

The self-efficacy means observed were 14.56 at the mid-test, 19.56 at post-test 2, and 22.56 at the retention test. The substantial F-statistic ($F(1,44) = 16386.60$, $p < .05$) indicates a strong impact of TG on the self-efficacy levels of students over time. The p-value ($< .05$) confirms the statistical significance of these findings, supporting the research hypothesis. Educational Theory of Vygotsky (1978), concept of the Zone of Proximal Development (ZPD) emphasizes the role of expert intervention in helping learners achieve tasks they cannot complete alone. In this context, TG can be seen as facilitating movement through the ZPD, thereby enhancing self-efficacy. Bandura's Social Cognitive Theory (1986), articulates that observational learning, social experiences, and environmental interactions are pivotal in developing self-efficacy. Teacher-Guided Instruction incorporates these elements by providing direct feedback, modeling desired behaviors, and fostering a supportive learning environment.

The results advocate for the continued use of Teacher-Guided Instruction in physical education, particularly in sports training where technique, confidence, and motivation are integral for success. Educators should focus on the quality of feedback and the appropriateness of task difficulty to optimize learning outcomes. Teacher-Guided Instruction significantly enhances self-efficacy in adolescent long jumpers, affirming its critical role in sports education. By effectively leveraging expert knowledge, direct feedback, and appropriate scaffolding, TG can substantially improve both the skills and the psychological resilience of young athletes.

Conclusion

The findings from this comprehensive study underscore the critical role of tailored feedback methods in improving both the physical performance and psychological resilience of young athletes. Each feedback type whether self-controlled, externally controlled, peer-reviewed, or teacher-guided has demonstrated significant efficacy in enhancing long jump performance and self-efficacy among adolescents. This research not only supports the integration of diverse feedback mechanisms into sports training programs but also highlights the importance of adapting instructional approaches to fit the developmental needs of students, fostering both skill enhancement and self-confidence. The suggestions for future research based on the findings from the study on feedback methods in long jump performance and self-efficacy among adolescents is examining the integration of emerging technologies, such as augmented reality (AR) and virtual reality (VR), with traditional feedback methods could innovate how feedback is delivered and perceived in sports training.

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