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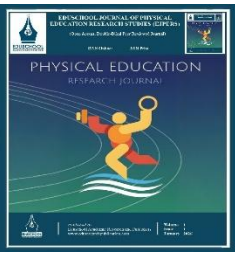


# Teacher Feedback Quality and Student Motivation in Sport-Based PE curricula

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**Abstract**

Teacher feedback is a critical instructional variable in physical education (PE), yet the relationship between feedback quality and student motivational and performance outcomes in sport-based curricula remains insufficiently understood. This study investigated how different dimensions of teacher feedback quality—specificity, timing, valence, and congruence—relate to student motivation and motor performance in secondary school sport-based PE programs. A multi-method design combined systematic observation of teacher feedback behaviors (n = 18 teachers, 864 lessons) with student surveys (n = 428) and motor performance assessments. Structural equation modeling revealed that feedback specificity ($\beta = .42$, $p < .001$) and congruence with learning objectives ($\beta = .38$, $p < .001$) were the strongest predictors of intrinsic motivation, which in turn mediated the relationship between feedback quality and performance improvement (indirect effect $\beta = .26$, $p < .001$). Immediate feedback was more effective for simple skills, while slightly delayed feedback benefited complex skill learning. Positive-corrective feedback (combining encouragement with specific correction) produced superior outcomes compared to purely positive or purely corrective feedback. The findings provide evidence-based guidelines for optimizing teacher feedback practices in sport-based PE curricula.

**Keywords**: - Teacher Feedback, Feedback Quality, Student Motivation, Motor Performance, Sport-Based Physical Education

## I. INTRODUCTION

Feedback is widely regarded as one of the most powerful influences on learning and achievement (Hattie & Timperley, 2007). In physical education, teacher feedback serves multiple functions: providing information about performance errors, reinforcing successful execution, motivating continued effort, and guiding learners toward desired movement outcomes (Rink, 2020). Despite its acknowledged importance, research on feedback in PE has historically focused on frequency and type (e.g., general vs. specific, positive vs. corrective) while paying insufficient attention to the multidimensional nature of feedback quality and its motivational implications (Koka & Hein, 2003).

Sport-based PE curricula present unique feedback demands. Unlike traditional multi-activity PE programs, sport-based approaches such as Sport Education (Siedentop et al., 2011) emphasize extended engagement with specific sports, creating contexts where feedback must support progressive skill development, tactical sophistication, and team dynamics over sustained periods. The quality of feedback in these extended units may be particularly consequential for maintaining student motivation and facilitating skill refinement beyond initial learning stages.

Self-determination theory (SDT; Deci & Ryan, 2000) provides a robust framework for understanding how feedback quality influences motivation. SDT posits that intrinsic motivation is fostered when environments support three basic psychological needs: competence, autonomy, and relatedness. Feedback that is specific, informational, and delivered in an autonomy-supportive manner enhances perceived competence and intrinsic motivation, while controlling or vague feedback may undermine these needs (Mouratidis et al., 2008).

This study aims to advance understanding of the feedback-motivation-performance relationship in sport-based PE by:

- Developing and validating a multidimensional framework for assessing teacher feedback quality
- Examining which feedback dimensions most strongly predict student motivation and performance
- Identifying moderating factors that influence the effectiveness of different feedback approaches.

## II. LITERATURE REVIEW

### 2.1. Dimensions of Feedback Quality

Hattie and Timperley's (2007) model of effective feedback identifies four levels: task, process, self-regulation, and self. Task-level feedback addresses the correctness of performance, process-level feedback targets the strategies used, self-regulation feedback encourages self-monitoring and adjustment, and self-level feedback (e.g., 'good girl') provides personal evaluation without performance information. Research consistently indicates that task and process-level feedback produce greater learning gains than self-level feedback (Kluger & DeNisi, 1996).

In PE contexts, Silverman et al. (1992) identified specificity as a key quality dimension, distinguishing between general feedback ('good job') and specific feedback ('your follow-through extended fully toward the target'). Specific feedback provides actionable information that guides subsequent performance attempts, whereas general feedback offers motivational support without instructional content. Magill (1994) further distinguished between knowledge of results (KR, outcome information) and knowledge of performance (KP, movement process information), noting that KP is generally more beneficial for complex motor skill acquisition.

### 2.2. Feedback and Motivation in PE

The relationship between teacher feedback and student motivation in PE has been examined through several theoretical lenses. Koka and Hein (2003) found that perceived positive general feedback and positive nonverbal feedback significantly predicted intrinsic motivation in PE. Mouratidis et al. (2008) demonstrated that positive informational feedback (combining encouragement with specific performance information) enhanced intrinsic motivation and effort, while positive but controlling feedback ('you did well, as you should') had weaker effects.

Nicaise et al. (2006) revealed gender differences in PE feedback patterns, with teachers providing more technical feedback to boys and more organizational feedback to girls. This differential feedback was associated with gender disparities in perceived competence and motivation, highlighting the equity implications of feedback quality. Koka and Hein (2005) further showed that the congruence between feedback content and students' personal goals moderated the motivation-feedback relationship.

### 2.3. Feedback Timing and Motor Skill Learning

The timing of feedback has important implications for motor learning. Traditional research supported immediate feedback for skill acquisition (Adams, 1971), but more recent work suggests a more nuanced picture. Swinnen (1996) proposed that immediate feedback benefits early learning stages by providing error correction, while delayed or reduced-frequency feedback enhances learning by promoting self-error detection and self-regulation. In PE settings, the practical challenge is that delayed feedback may lose its connection to the specific performance attempt, particularly when students are continuously active (Lee et al., 1994).

## III. METHODOLOGY

### 3.1. Participants and Context

Eighteen PE teachers (10 male, 8 female; mean experience = 11.3 years, SD = 5.7) and their students (n = 428; 224 male, 204 female; ages 13–17, M = 15.1, SD = 1.3) from six secondary schools participated. All schools implemented sport-based PE curricula featuring extended sport units (basketball, soccer, volleyball, badminton) of 8–10 weeks duration. Schools were purposively selected to represent urban, suburban, and rural contexts.

### 3.2. Data Collection

Teacher feedback behaviors were systematically observed and coded during 864 lessons (48 lessons per teacher) using a purpose-designed Teacher Feedback Quality Instrument (TFQI) developed for this study. The TFQI codes feedback along four dimensions:

- Specificity (general, specific-KR, specific-KP);
- Timing (immediate ≤5 sec, short delay 5–30 sec, delayed >30 sec);
- Valence (positive, corrective, positive-corrective combined);
- Congruence (aligned with stated learning objectives vs. unrelated).

Two trained observers coded all lessons with inter-observer agreement exceeding 92% across all categories (Cohen's $\kappa = .87$).

Student motivation was assessed using the Situational Motivation Scale adapted for PE (SIMS-PE; Guay et al., 2000), measuring intrinsic motivation, identified regulation, external regulation, and amotivation. Student perceived feedback quality was measured using a 16-item instrument adapted from Koka and Hein (2003). Motor performance was assessed through sport-specific skill tests (validated rubrics with ICC > .90) and game performance (GPAI; Oslin et al., 1998) at the beginning and end of each sport unit

### 3.3. Data Analysis

Structural equation modeling (SEM) using Mplus 8.0 was employed to test the hypothesized relationships between feedback quality dimensions, student motivation, and performance outcomes. Multilevel SEM accounted for the nested data structure (students within classes within teachers). Moderation analyses examined the effects of student gender, skill level, and sport type on feedback effectiveness. Model fit was evaluated using CFI, TLI, RMSEA, and SRMR criteria.

## IV. RESULTS

### 4.1. Descriptive Feedback Patterns

Teachers delivered an average of 64.3 feedback statements per lesson (SD = 18.7). The predominant feedback type was general positive (38.2%), followed by specific-KP (22.4%), specific-KR (15.1%), corrective (14.8%), and positive-corrective (9.5%). Only 52.3% of feedback statements were congruent with the stated learning objectives for the lesson. Immediate feedback constituted 61.4% of all statements, short-delay 28.3%, and delayed 10.3%.

Table 1. Descriptive Summary of Teacher Feedback Patterns (N = 864 lessons)

| Feedback Dimension | Category | Frequency (%) | M per Lesson (SD) |
|---|---|---|---|
| Specificity | General | 38.2% | 24.6 (8.1) |
| | Specific-KR | 15.1% | 9.7 (4.3) |
| | Specific-KP | 22.4% | 14.4 (5.8) |
| Valence | Positive only | 47.6% | 30.6 (9.2) |
| | Corrective only | 14.8% | 9.5 (4.1) |
| | Positive-Corrective | 9.5% | 6.1 (3.2) |
| Timing | Immediate | 61.4% | 39.5 (11.4) |
| | Short delay | 28.3% | 18.2 (6.8) |
| | Delayed | 10.3% | 6.6 (3.9) |
| Congruence | Aligned | 52.3% | 33.6 (10.7) |
| | Unrelated | 47.7% | 30.7 (9.8) |

### 4.2. Structural Equation Model

The SEM demonstrated good fit (CFI = .952, TLI = .941, RMSEA = .048, SRMR = .039). Feedback specificity was the strongest predictor of intrinsic motivation ($\beta = .42$, $p < .001$), followed by congruence with learning objectives ($\beta = .38$, $p < .001$). Feedback valence, specifically positive-corrective feedback, predicted intrinsic motivation ($\beta = .31$, $p < .001$) more strongly than purely positive ($\beta = .18$, $p < .01$) or purely corrective ($\beta = .12$, $p < .05$) feedback. Intrinsic motivation significantly mediated the feedback-performance relationship (indirect effect $\beta = .26$, $p < .001$), accounting for 58% of the total effect.

Table 2. Structural Equation Model Path Coefficients

| Path | β | SE | p | 95% CI |
|---|---|---|---|---|
| Specificity → Intrinsic Motivation | .42 | .06 | <.001 | [.30, .54] |
| Congruence → Intrinsic Motivation | .38 | .07 | <.001 | [.24, .52] |
| Positive-Corrective → Intrinsic Motivation | .31 | .06 | <.001 | [.19, .43] |
| Positive Only → Intrinsic Motivation | .18 | .05 | <.01 | [.08, .28] |
| Corrective Only → Intrinsic Motivation | .12 | .05 | <.05 | [.02, .22] |
| Intrinsic Motivation → Performance | .62 | .05 | <.001 | [.52, .72] |
| Indirect: Specificity → Perf. | .26 | .05 | <.001 | [.16, .36] |
| Indirect: Congruence → Perf. | .24 | .05 | <.001 | [.14, .34] |

### 4.3. Moderation Effects

Timing moderated the feedback-learning relationship as a function of skill complexity. For simple, discrete skills (e.g., volleyball serve), immediate feedback produced the largest performance gains ($d = 0.72$). For complex, continuous skills (e.g., basketball dribble-drive), short-delay feedback was more effective ($d = 0.61$ vs. $d = 0.43$ for immediate). Gender moderated the relationship between feedback valence and motivation: female students were more responsive to positive-corrective feedback ($\beta = .44$) than males ($\beta = .22$), while males responded more strongly to corrective-only feedback ($\beta = .28$) than females ($\beta = .08$).

Skill level also moderated feedback effects. Low-skilled students benefited most from specific-KP feedback ($d = 0.81$) and positive-corrective valence ($d = 0.74$), while high-skilled students showed greater responsiveness to specific-KR feedback ($d = 0.58$) and showed no differential effect of valence. These patterns suggest that feedback should be tailored to both the skill complexity and the learner's developmental stage.

## V. DISCUSSION

This study advances understanding of teacher feedback in sport-based PE by demonstrating that feedback quality is multidimensional and that different quality dimensions have differential effects on motivation and performance. The finding that specificity and congruence are the strongest predictors of intrinsic motivation has important practical implications. Nearly half (47.7%) of observed feedback was incongruent with lesson objectives, representing substantial missed learning opportunities. Teachers may benefit from structured planning that explicitly aligns anticipated feedback messages with learning intentions.

The superiority of positive-corrective feedback over purely positive or purely corrective feedback supports Mouratidis et al.'s (2008) findings and aligns with SDT predictions. Positive-corrective feedback simultaneously satisfies competence needs (by acknowledging successful elements) and provides informational content (by identifying areas for improvement), creating an optimal motivational and instructional combination. The finding that general positive feedback constituted the largest category (38.2%) yet was a weaker motivational predictor suggests that PE teachers' natural feedback tendencies may not align with evidence-based best practices.

The mediating role of intrinsic motivation confirms the theoretical pathway from feedback quality through motivation to performance. This has important implications for PE practice: feedback practices that undermine intrinsic motivation, even if technically accurate, may produce short-term compliance but fail to develop the sustained engagement necessary for long-term skill development and physical activity participation (Hagger & Chatzisarantis, 2007).

The gender and skill-level moderation effects highlight the need for differentiated feedback approaches. The finding that female students respond more positively to combined positive-corrective feedback suggests that embedded encouragement may be particularly important for maintaining female engagement in sport-based PE, where gender-based confidence gaps have been documented (Nicaise et al., 2006). Similarly, the differential effectiveness of KP versus KR feedback across skill levels underscores the importance of adapting feedback content to the learner's developmental stage.

Limitations include the observational nature of the feedback-motivation link, which precludes causal claims. Teacher awareness of being observed may have altered feedback behaviors (Hawthorne effect). The study focused on verbal feedback and did not examine nonverbal or gestural feedback, which constitutes a significant portion of PE teacher communication. Future research should examine feedback in non-sport PE contexts and employ experimental designs to establish causal relationships.

## VI. CONCLUSION

This study establishes that teacher feedback quality in sport-based PE is a multidimensional construct with significant implications for student motivation and performance. The evidence supports four key recommendations for PE teachers:

- Prioritize specific feedback (KP for novices, KR for advanced learners) over general praise.
- Combine positive and corrective elements within feedback statements.
- Ensure feedback is congruent with stated learning objectives.
- Adapt feedback timing to skill complexity.

Pre-service and in-service teacher education should emphasize feedback quality rather than feedback frequency, equipping teachers with the skills to deliver feedback that is simultaneously informative, motivating, and aligned with instructional goals.

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