

Strategies for Improving Classroom Feedback Effectiveness in Primary Schools with Technical Support

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ABSTRACT

Classroom feedback, with dual teaching and evaluation roles, is crucial for primary students' learning. However, its actual quality is inadequate—teachers lack in-depth understanding and systematic design, feedback is mostly diagnostic (failing to stimulate deep thinking), and participation scope is narrow. To address these issues, this paper proposes three approaches: 1) enhance teachers' theoretical knowledge and self-reflection; 2) use CRS to enable universal participation and diverse feedback; 3) promote cyclic development of technology application and teachers' feedback capabilities for a virtuous circle. These aim to provide references for improving teachers' feedback skills and classroom effectiveness.

KEYWORDS

Classroom feedback; Teachers' feedback skills; Classroom effectiveness

1 Introduction

Classroom questioning-answering, a key teaching interaction link, comprises four interconnected stages: questioning, wait time, student selection, and classroom feedback. Classroom feedback—teachers' responses to students' answers (via verbal, body language, or facial expressions)—has dual teaching and evaluation roles: it reinforces learning, stimulates curiosity^[1], and assesses answer quality and thinking depth, directly impacting learning efficiency and interest.

However, in primary school classrooms, the student is lively and active^[2], limited class time and teaching tasks often prevent teachers from providing comprehensive, in-depth feedback to most students. To address this, this study explores using Classroom Response System (CRS) technology to optimize classroom feedback processes and methods, aiming to enhance its effectiveness and offer new approaches for improving primary school teaching quality.

2 Theoretical Basis

As a core component of classroom questioning and answering, classroom feedback is grounded in profound and diverse theoretical foundations, mainly including dialogic teaching theory, teacher-student interaction theory, and multiple intelligences theory. These theories not only provide a solid theoretical support for classroom feedback but also play a crucial guiding role in practical application.

Dialogic teaching takes "communicative dialogue" as its essence^[3]. This teaching theory highlights dialogue as key to ideological exchange and mutual understanding in teaching. In classroom interaction, feedback is a critical link: teachers respond to students' answers to guide in-depth thinking and knowledge internalization. It provides an important perspective on how feedback boosts students' thinking development and teaching effectiveness.

Symbolic interactionism is an anti-positivist sociological theory that focuses on interpersonal interactions in society from a micro perspective^[4]. Teaching is essentially interaction. Centered on teacher-student mutual influence, classroom feedback is a key form of their interaction in Q&A. It helps teachers grasp students' learning status, adjust teaching strategies, and stimulate learning enthusiasm. This theory emphasizes feedback's value in promoting teacher-student emotional communication and building harmonious relationships, guiding feedback practice.

Multiple intelligences theory points out that each student possesses a variety of intelligences^[5]. These intelligences vary in developmental level and manifestation. Classroom feedback in Q&A should address individual differences and boost multiple intelligences development—teachers can use diverse forms (verbal, body language, facial expressions) to match different students' intellectual traits. This theory provides a key basis for feedback to support personalized development.

Based on the above, this study holds that dialogic teaching theory, teacher-student interaction theory, and multiple intelligences theory should serve as the cornerstones. With the support of CRS technology, it is ensured that sufficient consideration is given to the dialogue and communication between teachers and students in the process of classroom feedback, promoting full interaction between them. This enables teachers to comprehensively and accurately understand the classroom feedback status of different students, thereby implementing teaching students in accordance with their aptitude and effectively addressing students' individual differences.

3 Current Situation and Analysis of Classroom Feedback

Based on the analysis of existing literature and in-depth interviews with 5 frontline teachers, the current situation of classroom feedback can be summarized into the following two points:

3.1 Teachers' Insufficient Understanding of Classroom Feedback and the Singleness of Feedback Content

Though teachers recognize classroom feedback as a key part of Q&A interactions, their understanding remains superficial: they lack a deep grasp of the term "classroom feedback," are unfamiliar with its diverse types, and fail to design the feedback link systematically. This limits feedback's role in boosting students' engagement and reflective abilities, and may weaken students' recognition of Q&A's value over time. Insufficient understanding leads to practice dominated by diagnostic feedback—focused solely on informing students if their answers are correct. While this reflects answer accuracy quickly, it offers little substantive guidance for learning. Such feedback results in superficial teacher-student interaction without in-depth intellectual exchange, hindering students' deep thinking and critical thinking development, and failing to fully stimulate their intrinsic motivation. Especially for less engaged students, this one-size-fits-all model reduces Q&A to a formal process, greatly diminishing its educational value. Students gain no substantial learning improvements, missing opportunities for active participation, self-reflection, and skill enhancement. In the long run, students may develop an unhealthy reliance on external evaluations, with weakened self-assessment and adjustment abilities, seriously restricting the comprehensive development of their learning capabilities.

3.2 Narrow Scope of Classroom Feedback, with Most Students Failing to Receive Reasonable Feedback

As the terminal link of the questioning-answering interaction process, classroom feedback is closely intertwined with and interdependent on teachers' questioning behavior. In classroom teaching practice, teachers often promote the questioning-answering process by selecting students to answer. However, this selection process often hides subjective biases. Studies have shown that teachers may be more inclined to choose students with excellent classroom performance and harmonious daily relationships with themselves to participate in questioning and answering. In this context, the ideological exchange between teachers and students through dialogue and questioning is indeed conducive to improving the learning outcomes of the selected students. But the problem lies in the coverage of teacher-student interaction: due to the limited classroom time, teachers find it difficult to select a wide range of students to participate in questioning and answering, resulting in only a few students being able to experience and benefit from the interaction. The remaining students become "bystanders", gradually drifting away from the core of classroom questioning and answering and becoming marginalized groups. Their learning engagement, participation, and learning effects are all significantly restricted, and psychological negative impacts may even occur. When the number of students participating in questioning and answering is significantly limited, teachers' feedback behavior is inevitably confined to a small number of students, leaving most students unable to obtain timely and reasonable feedback, thereby hindering their thinking development. At the same time, teachers can only infer the overall learning progress and status through the answers of a few students. This limitation of feedback has become a norm in traditional classrooms and a difficult problem that conventional feedback strategies are hard to overcome.

4 Paths for Improving the Effectiveness of Classroom Feedback

4.1 Prioritize Ideological Understanding to Enhance Teachers' Comprehension of Instructional Feedback

To effectively deepen teachers' in-depth understanding of classroom instructional feedback and improve their skills in applying it in teaching practice, targeted efforts should be made in two key dimensions: theoretical learning and self-reflection.

In terms of theoretical learning, systematic and tailored training programs should be implemented. Invite seasoned experts and scholars with remarkable achievements in education to deliver special lectures on campus regularly. The lecture content should be comprehensive: not only elaborating on the basic concepts of instructional feedback to clarify its precise positioning and critical role in classroom teaching, but also analyzing various supporting educational theories (e. g., dialogic teaching theory emphasizing the significance of equal teacher-student dialogue for knowledge construction, teacher-student interaction theory revealing the intrinsic connection between interaction patterns and feedback methods, and multiple intelligences theory guiding teachers to adopt differentiated feedback strategies for students with diverse intelligence types). Additionally, practical feedback strategies tailored to the characteristics and needs of different subjects should be introduced.

In terms of self-reflection, teachers are encouraged to actively engage in self-examination and experience refinement. Establish a teaching reflection journal system requiring teachers to record detailed information about classroom feedback regularly, including the appropriateness of feedback timing, effectiveness of methods used, student responses, and ultimate teaching outcomes. Based on this, teachers should conduct in-depth reflections on the strengths and weaknesses of their feedback practices, analyze successful experiences for replication, and identify problems to explore improvement directions.

4.2 Leverage Technology to Improve Feedback Effectiveness

Technology can be integrated into teaching as follows: during instruction, teachers use intelligent software to fully manage classroom questioning sessions. After teachers pose questions, students respond using voice-enabled clickers, with diverse response formats including button presses for multiple-choice questions and voice input for open-ended

tasks. The clickers collect students' acoustic data and transmit it accurately via wireless technology to a receiver securely connected to the classroom computer through a USB port. The receiver processes the data and displays students' answers clearly and accurately on the computer, providing data support and a basis for teachers' subsequent feedback(As shown in Figure 1).

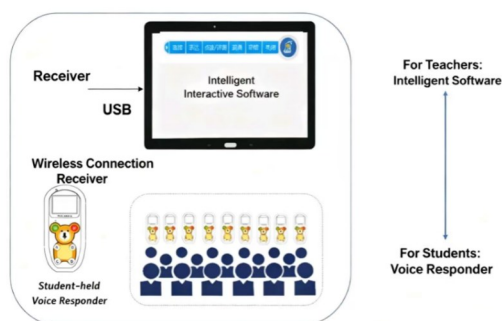


Figure 1

4.2.1 "Silent Click Response" for Multiple-Choice Questions

In traditional classroom questioning, a common phenomenon is that some students dominate responses while others passively follow, making it difficult for teachers to accurately identify underachieving students and provide targeted support. The "silent click response" model, however, utilizes clickers and digital platforms to enable all students to answer multiple-choice questions simultaneously. After responses are submitted, students are guided to explain their choices verbally, with their voices converted into text to gain insight into their thinking processes and perspectives. This technology not only breaks the limitation of "visible participation" in traditional questioning but also helps teachers precisely locate disadvantaged students who are overlooked due to expression barriers, weak academic foundations, or unique thinking styles(As shown in Figure 2).



Figure 2

Using a Classroom Response System (CRS) for questioning ensures that every student has equal rights and opportunities to participate. For teachers, the collective responses serve as a diagnostic tool to promptly grasp each student's participation level and answer accuracy, facilitating a comprehensive and objective understanding of the entire class's actual learning situation. This encourages students to engage in meaningful thinking, promotes the development of all students, and realizes classroom equity. The CRS-enabled collective response function collects, records, and presents answer data through technical means, allowing teachers to intuitively access all students' answers, analyze teaching effectiveness based on their performance, and adjust teaching activities in real time.

4.2.2 "Universal Participation" for Short-answer Questions

As a modern teaching aid, the Classroom Response System (CRS) is designed to enhance classroom interaction and student engagement while minimizing technical barriers and costs, making it accessible to a wide range of educational settings.

Though simple in structure, it embodies the essence of efficient teaching interaction and technological innovation. Integrating voice recognition technology with the CRS's "one device per student" configuration further expands channels for student participation in classroom feedback, achieving full coverage and adequate engagement.

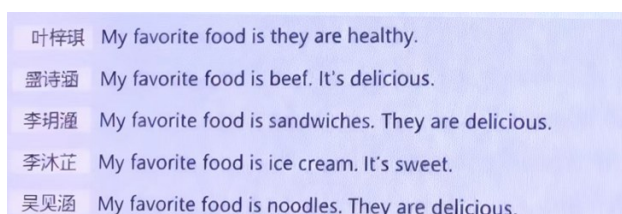


Figure 3

Through clickers, the system collects students' answers and displays them instantly on the classroom screen (As shown in Figure 3).

Based on this, two feedback strategies can be derived:

Teacher-led feedback: In essence, this refers to the feedback teachers provide after students answer questions. In classroom questioning, feedback can be categorized into immediate feedback and delayed feedback based on response speed, with the core difference lying in the amount of thinking time allocated to students. According to Bloom's Taxonomy of Educational Objectives, immediate feedback is suitable for low-level cognitive tasks such as remembering, understanding, and applying; delayed feedback, by contrast, is more appropriate for higher cognitive objectives (e.g., analyzing, synthesizing, evaluating), as it reserves time for students to engage in deep learning and knowledge construction. Different types of questions trigger different feedback formats during classroom interaction.

Student-student discussion: Interpersonal interaction theory in classrooms includes not only teacher-student interaction but also peer interaction^[6]. Classroom feedback, based on answer data, is a series of student-centered, feedback-driven, and revision-oriented interactive learning activities. After students answer questions, the CRS provides real-time feedback on their performance without revealing the correct answers. At this point, teachers can group students with different answers into collaborative teams, encouraging them to communicate, cooperate, and discuss the correct answers through dialogue and negotiation. During group discussions, students can independently evaluate and revise their answers or construct new knowledge.

4.2.3 Circular Development of Teachers' Technological Competence and Feedback Capability

Teachers' proficiency in technology can: enrich feedback materials and evidence by enabling access to multi-dimensional student data; expand feedback methods and formats through diverse technical feedback tools; and realize personalized feedback by providing targeted guidance based on students' individual profiles.

Conversely, improved feedback capability helps teachers: clarify the direction and priorities of technology application by selecting key technical functions based on teaching needs; promote technological innovation and optimization by providing feedback to developers on practical issues; and facilitate in-depth integration and application of technology by flexibly using technical functions to create diverse teaching scenarios and feedback models.

This circular relationship between technological competence and feedback capability forms a virtuous interactive ecosystem. Within this system, enhanced technological competence provides stronger support and richer tools for teachers' feedback practices, enabling more precise and efficient feedback to promote student learning and development. Meanwhile, improved feedback capability guides technology application, driving continuous technological innovation and optimization to better meet teaching needs and enhance technological value. This virtuous cycle ultimately achieves an overall improvement in teaching quality.

5 Conclusion

This study proposes three pathways to improve instructional feedback in current primary school classrooms. However, it is important to note that the instructional feedback process is closely intertwined with the entire classroom questioning process. This study focuses primarily on the feedback stage and therefore does not elaborate on aspects such as question design and wait time. These areas also require continuous optimization, and future research will strive to explore them through ongoing practice and verification to further enhance the effectiveness of classroom questioning and feedback.

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