

Teacher Feedback Practice: Perceptions of Middle and High School Students in Mainland China

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Abstract. Teacher feedback occurs in almost every lesson and is increasingly seen as a key factor in student performance. How do students, as the recipients of feedback, perceive teacher feedback? This study aimed to investigate middle and high school students perception of teacher feedback practices in mathematics. Survey data were collected from 1,087 students (647 middle school students and 440 high school students) in three schools in mainland China. The results indicated that middle school students viewed feedback perceptions more positively than high school students, with boys reporting higher levels of feedback perceptions than girls. Further, implications for future research are discussed.

1 Introduction

Feedback has been depicted as paramount to learning and achievement ^[1,2]. The concept of teacher feedback refers to the information provided by the teacher about the student's performance or understanding ^[3]. Providing feedback is an essential component of formative assessment and is widely acknowledged as a professional skill for instructors ^[3,4]. Considerable research has been conducted regarding how feedback affects students' learning outcomes ^[5,6,7]. For example, Ajjawi and Boud ^[8] and Feeney ^[9] identified that teacher feedback practices frequently does not lead to facilitate student learning in classroom. Such research has shown that the qualities of feedback are crucial: corrective feedback is frequently less successful than feedback message with explanatory or strategic information; however, the effectiveness of feedback is still up for debate in many ways. Even after more than a century of feedback study, many aspects of the connection between feedback and learning are still poorly understood and ambiguous. To fill the gap, the study presented in this paper focuses on how students perceive teacher feedback.

Feedback is becoming a more complicated concept. Conventionally, feedback refers to the transmission of information from the provider to the recipient in a one-way manner ^[3,10]. Past researchers assumed that if productive feedback was delivered, then learning will automatically follow ^[11]. Providing effective feedback can help to maximize the benefit to students ^[12,13]. However, the point is that even if some or all the conditions are in place for effective feedback, this does not necessarily mean that effective feedback truly works for students ^[5]. According to Havnes et al. ^[14] and Price et al. ^[15], lack of engagement could occur if students do not notice the feedback, or, if they do, they do not perceive feedback as

supportive, or they do not absorb or have the time to use it, or choose not to or are unable to use it. For the purposes of this study, instead of being a one-way message transmission with learning as the assumed result, feedback is described as a process of interpretation that could or could not result in learning ^[10]. Perceiving the meaning and expectations and value of feedback is a key requirement for effective absorption of feedback to facilitate student learning ^[16,5]. Considerable literature on students' perception of feedback has concentrated on higher education ^[17,18,19], and limited studies have been conducted in middle and high school contexts. In addition, little was known about whether mathematics teachers are influenced by student grade level and whether they provide varied feedback perceptions when referring to a middle or a high school student; therefore, the research aim to diminish the gap on the topic.

2 Research Questions

Two research questions were proposed based on the above theoretical and empirical elaboration:

1. How do middle and high school students perceive teacher feedback?

2. Is there a significant difference in the perception of feedback for middle and high school students?

3 Materials and Methods

3.1 Participants

Sample accessing the study comprised middle and high school students from mainland China. In total, 1,087 students [647 middle school students (59.5%) and 440 high school students (40.5%)] participated in the research.

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Participants came from two middle and one high school in Yunnan and one middle school in Sichuan. Two different kinds of schools were recruited to make the sample is more representative. Two schools are located in the urban area and have access to sufficient learning resources like cutting-edge teaching tools and online tutorial courses, while the two others are located in the suburbs and have few learning resources.

3.2 Feedback Practice Perceptions Survey

One Norwegian researcher provided a self-report survey [16] of feedback practice, which was translated by researcher from English and modified to adapt to the research aims and the educational context of China. It included two dimensions of teacher feedback: *Feedback quality* and *Facilitation of feedback use*. The survey consists of 11 items with ratings on a 5-point Likert scale (1 = *never agree* and 5 = *totally agree*). Cronbach's α reliability was analyzed to validate the scales using in the survey instrument, which was shown in Table 1. Additionally, one open-ended item (Other comments you want to add concerning teacher feedback) also included in the feedback perceptions survey where the participants may provide additional input. The open-ended item was designed to collect qualitative data to complement the quantitative data to (1) gain insight into the nature of different participants' feedback perceptions through their own words, and (2) to get perceptions on potentially important topics not covered in the survey items. A pilot study was conducted on 42 middle school students to ensure clarity of the questions.

Table 1. Reliability of the two scales

	Feedback quality (8 items)	Facilitation of feedback use (3 items)
Cronbach's α	0.933	0.899

3.3 Data analyses

Three sets of analyses were conducted. First, overall feedback perceptions for middle and high school students were compared separately using the mean scaled scores. Second, to compare specific differences in middle and high school students feedback perceptions, we computed the independent-sample t-test using the SPSS 23 software. In addition, to investigate the nature of the distinctions between middle school and high school students' perceptions of feedback, Item-level analyses were conducted by independent sample t-test using the SPSS 23 software. Third, thematic content analysis conducted by NVivo 11 was used to summarize the qualitative information gleaned from students' answers to the open-ended question.

4 Results

4.1 Quantitative feedback perception results

The mean responses of students on the different scales and a comparison of middle and high school students' perceptions of the feedback were depicted in Table 2. Overall, middle and high school students were strongly positive about the quality of mathematical feedback. Compared with feedback quality, both middle and high school students were slightly less positive about the facilitation of feedback use, with middle school students responding more positively than high school students. In addition, middle and high school male students were more positive about the quality of feedback and facilitation of feedback use than that of female students, with the gender differences between middle school students were greater than that between high school students. T-test results suggested that there was a statistically significant difference between the mean scores for female students and male students concerning the feedback quality in middle school. This indicated that male students are more inclined than female students to acknowledge the feedback quality and facilitation of feedback. No statistically gender significant difference was found in high school students.

Table 2. Mean scale scores and within group comparison for perceptions of Feedback quality and Facilitation of feedback use

Group	Gender	Feedback quality		Comparison between different gender ^a		Facilitation of feedback use		Comparison between different gender ^a	
		M	SD	<i>t</i>	<i>P-value</i>	M	SD	<i>t</i>	<i>P-value</i>
Middle School	Female	4.37	0.68	3.533	<.001 **	4.37	0.74	2.379	0.18
	Male	4.54	0.57			4.51	0.70		
High School	Female	4.17	0.81	0.190	0.850	4.08	0.955	0.368	0.713
	Male	4.19	0.83			4.11	0.887		

Note. ^a = Independent Sample *t*-test. ***p* < .001.

Table 3. Item descriptions, student responses, and item-level significance tests for mathematics

Student survey item	Middle school (n=647)		High school (n=440)		<i>p</i> ^a
	M	SD	M	SD	
Feedback quality scale					
I receive feedback that is helpful for my learning.	4.55	0.73	4.28	0.90	<.001**
We receive feedback and a grade.	4.42	0.80	4.17	0.96	<.001**
The teacher encourages us to use this feedback to revise our work.	4.49	0.79	4.27	0.85	<.001**
The teacher explains me how to improve the subject.	4.58	0.67	4.32	0.87	<.001**
I am aware of what I need to work to improve my learning.	4.34	0.86	4.00	1.03	<.001**
The teacher tells me where I can improve.	4.43	0.78	4.12	0.97	<.001**
The feedback I receive on works shows clearly what is expected of me.	4.42	0.74	4.13	0.96	<.001**
I understand the teacher feedback.	4.46	0.75	4.16	0.94	<.001**
Facilitation of feedback use scale					
I get time to work on feedback in class individually.	4.47	0.78	4.00	1.09	<.001**
I get time to work on feedback in class in groups.	4.47	0.75	4.15	0.96	<.001**
The teacher checks whether we have used feedback.	4.38	0.85	4.14	0.94	<.001**

Note. ***p* < .001.

a = Independent Sample t-test.

1 = Never agree, 2 = Slightly disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

An description of all items, student responses, and item-level significance tests are presented in Table 3. Both middle and high school students responded above agree ($M > 4$) to all feedback perception items. Middle school students responded particularly positively ($M > 4.5$) about receiving helpful feedback to support learning, and the teacher explain to learners how to improve mathematics. Similarly, high school students were rather positive ($M > 4.2$) on the two items. Middle school students were less positive ($M < 4.4$) about what they need to improve. Additionally, this pattern was seen in the data from high school students ($M < 4$), indicating that both two levels of students have difficulty in practical actions via feedback. Significant differences between middle and high school student perceptions of teacher feedback quality and teacher facilitation of feedback use were found on all items in mathematics. Interestingly, middle school students were more positive than high school students on all items. Concerning student perceptions of facilitation of feedback use, middle school students identified that teachers' following check, if they have used feedback on assessments, was comparatively low, indicating that the use of feedback is primarily a personal endeavor. While high school students were least positive ($M \leq 4$) about getting time in class to work on feedback individually, suggesting that they have little free time to learn.

4.2 Qualitative student feedback perception results

In the feedback survey, 94 middle school students and 31 high school students answered the open-ended questions. Their comments varied in length from 2 to 200 words. Seven themes were categorised from the student

responses.: wanting varied forms of feedback (Sn=19; Hn=7), reflections on engagement with feedback (Sn=19; Hn=3), criticism of the teacher (not feedback related, Sn=6; Hn=1) and usefulness of feedback (Sn=35; Hn=13), expectation for teachers (not feedback related, Sn=7; Hn=4), reflections about mathematics (not feedback related, Sn=3; Hn=1), reflections of curriculum or assessment practice (Sn=5; Hn=2).

Twenty-six students indicated that they would like to receive varied forms of feedback. Most of students (n=14) wanted more detailed feedback. For instance, one Year 9 girl commented: "I think feedback should be more detailed rather than self-directed." Six students explicitly stated that they would like teachers to speak at a slower pace when giving verbal feedback in class. For instance, a Year 7 boy commented that he can understand the teacher's feedback better if the teacher speaks slower. Further, two students mentioned that teacher feedback was not always clear. For instance, a Year 8 girl commented: "Don't always say terms like building some kind of system, don't make it sound so complicated, and give contextual examples when giving feedback." Four students expressed a desire to get feedback specifying their achievements, indicating what they had done well and giving encouragement. Interestingly, four students (two Year 10 and two Year 12 girls) suggested that the teacher's feedback could be more focused on the methods and techniques used to solve the problems so that higher marks are more likely to be achieved. Notably, a year 11 boy wanted to write neatly when the teacher commented.

Students' comments on the usefulness of the feedback (n = 48) were mostly positive. For example, one Year 9 boy noted: I am grateful for the feedback I received from my teacher, which helped me to understand what I did well and also helped me to identify areas where I could improve, which were key to my progress in maths.

However, seven students indicated that feedback was not always helpful, for example, because it “may not be clear and not always suit me well” (Year 8 boy), or because it was general and did not specify areas for improvement (Year 10 girl).

Twenty-one students reflected on their engagement with feedback. For instance, a Year 8 girl noted: the teacher's feedback allowed me to think more deeply about knowledge and the teacher's detailed feedback allowed me to exercise self-discipline skills. Regarding the reflections of curriculum or assessment practice, one Year 9 boy acknowledged that education in schools is not so diverse and teacher training should be enhanced to improve teachers' competencies.

In conclusion, the qualitative analysis indicated that detailed feedback which specifies areas that could be improved, and feedback with explanation and strategies or techniques were thirsty for students. However, there was often a gap between the feedback practices students perceived and those they expected. These results showed that how teachers provide feedback is crucial for how students receive it. Students found it helpful when feedback was provided clearly and encouragingly and giving contextualized examples to illustrate abstract knowledge; students hoped that increased training for teachers might make the feedback process more enjoyable for them.

5 Conclusions

The results revealed that students do perceive feedback to be effective, which is consistent with the results of the study carried out by Rowe and Wood [20]. However, the feedback that students expect to get does not seem to match what they realistically receive in class. Consistent with previous research [16], the results of the qualitative study found that the way in which teachers provided feedback posed a barrier to some extent to the reception of feedback by students. For instance, several students reflected that teacher feedback was too complex to understand. Concerning the written feedback, students hope that teacher's handwriting to be more legible to recognize.

Noteworthy is the finding that there is not equality in teacher feedback perception between Middle and High school students and, that middle students have more positive feedback perception than higher students. Presumably, this reflects the fact that middle students, compared to high school students, generally trust their teachers; in this aspect, the more general positive attitude of middle school students may be due, at least in part, to the influence of age limitations, the ability to think independently and the scope and depth of knowledge.

For both middle and high students, however, there is a trend that the perception of facilitation of feedback were slightly less positive than feedback quality. This implies that perhaps (1) teacher's practice of facilitating feedback did not match the students' expectations practices, or (2) students did not notice all the teacher's practices regarding facilitating classroom feedback.

Results showed that male and female learners in middle school reported teacher feedback quality would differ in math learning. Males reported higher levels of perception of feedback quality and facilitation of feedback use. The finding contradicts the findings of previous research by van der Kleij [16] but aligns with a study carried out by Havnes [14], where gender was a variable that affects perceptions. Thus, these should be taken into consideration by teachers who give feedback for their students. Interestingly, statistically significant gender differences were not found in high school. This may be because adolescent girls reach developmental milestones, including self-awareness, earlier than boys but that these differences decreased with age [21].

Additionally, it was also found that high school students have little time to work on feedback individually. This suggested that high school students have less independent learning time available in the classroom. This may be because a lot of their class time is taken up by teachers' lectures to help students better prepare for the entrance exams [22]; therefore, to facilitate students' use of feedback to reflect on personal improvement, teachers must strike a balance between collective classroom lecture time and student self-learning time.

In interpreting the findings of the study, several limitations should be noted. Firstly, the study sample for this research is limited in its representativeness as the participants were only from Sichuan and Yunnan, China. The sample should be larger and more representative in future related studies. Secondly, the present research was based on self-reported data, and they could be susceptible to response bias. Thus, future studies should conduct classroom observations or experimental measures to support the findings of this study. Thirdly, the results of this study were only from the students' perspective; future studies could triangulate the results by examining them from both the teachers' and students' perspectives. Finally, just as Harris [23] pointed that students' perception of feedback is key to determining the use of feedback and subsequent learning improvement. It is also worthwhile to shed light on how individual student variables may affect student perception of teachers' feedback in further study.

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