

The Effect of Positive Teacher Feedback on Middle School Students' Motivation: Mediated by Self-efficacy

Danyang Li

Xianda School of Economics and Humanities, Shanghai International Studies University, Shanghai, 236000, China

ABSTRACT

This study focuses on how teachers affect middle school students' motivation when they give positive feedback. At the same time, it analyzes the role that self-efficacy plays in it. The sample was 720 junior high school students, and the data used were the results of a valid questionnaire. The study employed group administration, questionnaire surveys, and analysis of variance. Structural equation modeling was applied in the data analysis and mediating effects were tested by Bootstrap method. The results showed that positive feedback from teachers can enhance students' academic performance as well as their participation in the classroom. At the same time, this feedback helps to enhance students' self-efficacy and further motivate them to learn.

KEYWORDS

Positive feedback; Motivation to learn; Self-efficacy; Middle school students; Educational psychology

1 Introduction

Learning motivation is a kind of conscious behavioral activity that can awaken, maintain and guide students' learning activities, and it is the internal psychological state that prompts students to accomplish certain learning purposes^[1], as the basic driving force of students' learning behavior, it can best reflect the purposefulness and mobility of students' learning behavior^[2]. There are many problems in junior high school students' learning, and the mastery of professional skills knowledge can only rely on the teacher's requirements and parents' supervision, their future development. The 'Compulsory Education English Curriculum Standards emphasizes the "Teaching-Learning-Evaluation" integrated design, encouraging teachers to make scientific use of evaluation tools and results, and provide timely feedback and assistance in response to students' learning performance. One study found that more than 70% of junior high school students significantly adjust their learning attitudes and behaviors in the learning process due to teachers' praise or criticism^[3]. This external dependence reflects that junior high school students have not yet fully formed independent internal learning goals, and rely more on external incentives to maintain their enthusiasm for learning. Feedback is a key factor influencing students' learning effectiveness^[4]. In Hattie's Visible learning study, feedback was recognized as one of the strong factors affecting learning and academic achievement, with an effect size of up to 0.79. However, the effect of feedback can be positive or negative. Researchers^[5] demonstrated the applicability of positive feedback to middle school students. Positive teacher feedback can stimulate interest in learning, increase self-confidence, improve self-efficacy, enhance positive emotions^[6], and also promote teacher-student and peer relationships, etc.^[7] Similarly, it can also motivate students^[8]. For feedback to work, students need to be actively involved. Self-efficacy was introduced by psychologist Bandura in 1977. It refers to an individual's judgment of his or her ability to accomplish a task. In terms of motivation, students with a strong sense of self-efficacy are more willing to take the initiative to learn. They are more likely to set challenging goals and are more motivated to accomplish them. Moreover, studying only the correlation between the variables is not sufficient. It is also necessary to further understand the intrinsic relationship between them. According to Brandon, self-efficacy plays a central role in motivational regulation. It has been found that high self-efficacy can guide individuals to focus their attention on learning events and drive their motivation to achieve good learning outcomes^[9]. Previous researchers^[10] demonstrated that written rubrics also have a significant effect on feedback effectiveness. Different types of written feedback may bring different results^[11].

However, in actual teaching, teachers have problems such as weak awareness of feedback, weak timeliness of feedback, and unreasonable design of feedback activities^[12]. From the current status of a large number of classroom teaching, many teachers have insufficient understanding of the significance of feedback, poor mastery of the feedback strategy, and do not pay much attention to the classroom to make reasonable feedback on students' learning behaviors, resulting in the function of the feedback behavior does not play its due role. Therefore, it is particularly important to explore effective strategies to stimulate and maintain junior high school students' learning motivation.

Therefore, based on the above research compilation, this study concluded that: there may be a positive correlation between teachers' positive feedback and junior high school students' motivation; students' self-efficacy has a mediating role in the relationship between teachers' positive feedback and junior high school students' motivation

2 The research process

2.1 Purpose of the study

This study focuses on analyzing the effects of positive teacher feedback on middle school students' motivation. The study set self-efficacy as a mediating variable for explaining the specific process of feedback influence. In order to realize the research goal, we propose that teachers' positive feedback can directly improve students' learning motivation. The study selected 720 junior high school students from grades 7 to 9 in a middle school in Fuyang, Anhui Province, as survey respondents. The study further explored the mediating role of self-efficacy. We believe that when students receive positive feedback, this external motivation can be transformed into internal motivation. Students will be more confident in their abilities and more willing to face challenges in their studies. An increased sense of self-efficacy will motivate them to be more actively engaged in learning.

2.2 Subjects of the study

Convenience sampling was used to select the first to third year students and teachers of a middle school in Anhui Province as the subjects of the study, and it was expected that 720 students would be divided into 3 groups as subjects, one group as personal feedback group, one group as process feedback group, and one group as control group, with about 240 students in each group. In total, 720 questionnaires were distributed and 702 questionnaires were recovered from the classroom, and 626 valid questionnaires were obtained after excluding invalid questionnaires.

2.3 Research tools

2.3.1 Raven's reasoning tests

In this study, we chose Raven's Progressive Matrices (RAPM) as the material for creating a feedback context.

2.3.2 General self-efficacy scale (GSES)

The general self-efficacy scale developed by Schwarzer was administered separately to each group. The scale has good reliability and validity and reflects the individual's confidence in his/her ability to accomplish tasks and cope with challenges. A 44-point scale ranging from "not at all true" to "completely true" was used, with scores ranging from 1 to 44, respectively. Higher scores indicate greater general self-efficacy. In this study, the Cronbach's α coefficient was 0.87.

2.3.3 Learning motivation scale for junior high school students: reference: motivation for learning diagnostic test (MAAT)

The Motivation for Academic Advancement Diagnostic Test (MAAT), a scale covering several dimensions of intrinsic and extrinsic motivation. It was administered to the two groups separately. The Cronbach's α of the scale was 0.7, and the scoring method: Likert scale was used, from "strongly disagree" to "strongly agree", with scores from 1 to 5 respectively. The Cronbach's α coefficient and the reliability of the scale were calculated using SPSS 19.0 software, and the validity factor (CFA) was analyzed using AMOS 24.0 software.

3 Research procedures

This study was conducted through cooperation with each school, with the consent of the students themselves, using the time of the psychology class, in order to ensure the authenticity and validity of the data, the investigators were trained before the distribution of the questionnaires, clarifying the purpose of the survey, the methodology, and the precautions to be taken, and the questionnaires were distributed by trained assistants to the schools on a class-by-class basis. Before distributing the questionnaires, the purpose of the study and the method of filling out the questionnaires were explained to the students to ensure that they understood and filled out the questionnaires carefully. After the questionnaires were

collected, the data were screened and organized and invalid questionnaires were deleted. The primary test-taker entered the class, informed the subjects that they would be given a graphical reasoning quiz, and arranged for an assistant to monitor the classroom order to avoid interacting with each other. The quiz questions were distributed and retrieved after 5 minutes of answering.

In this study, the categorization of individual and process feedback was used, and simple neutral feedback was used as a control group, and feedback was given in the form of group administration of the test and writing comments on the transcripts to ensure the authenticity and validity of the feedback statements. In addition, all feedback statements were written and completed by the main test and graduate students of the Department of Psychology before the experiment to control for experimenter effects. The various types of feedback were as follows: (1) Personal positive feedback, such as "You got 8 questions right, so I can see that you are very smart!" (2) Process positive feedback, e.g., "You got 8 questions right, you must have worked hard!" (3) Simple outcome feedback, e.g., "You got eight questions right!". Feedback rubrics were written on report cards and distributed to students corresponding to the feedback type, and students were tested for motivation and self-efficacy. The questionnaires were completed and submitted on the spot. The data obtained were analyzed using SPSS 19.0 and Mplus 8.5.

3.1 Data analysis

In this study, the 626 valid questionnaires were analyzed by SPSS 19.0, and the internal consistency and structural appropriateness of the GSES self-efficacy scale and the MAAT motivation scale were verified by the reliability and validity tests before the related analysis was formally carried out. As shown in Table 1, the self-efficacy scale: $\alpha = 0.89$ (very high reliability), and the study motivation scale: $\alpha = 0.92$, indicating that the scales have high reliability; the KMO values are 0.85 and 0.88, indicating that the validity coefficients meet the requirements, and they are suitable for factor analysis. Then descriptive statistical analysis and difference analysis were carried out.

Table 1 Cronbach's alpha coefficient and KMO values Bartlett's test of sphericity

measures	Cronbach's alpha coefficient	KMO value	Bartlett's test of sphericity (p)
GSES (self-efficacy)	0.89	0.85	< 0.001
MAAT (motivation to learn)	0.92	0.88	< 0.001

3.2 Relationship between teachers' positive feedback and students' motivation and self-efficacy

Table 2 Mean scores of the feedback groups

feedback group	Self-efficacy M	Self-efficacy SD	Learning Motivation M	Learning Motivation SD
Individual feedback groups	31.14	4.91	3.2	0.5
control group	30.02	6.05	3.08	0.59
Process Feedback Group	35.29	3.81	4.02	0.42

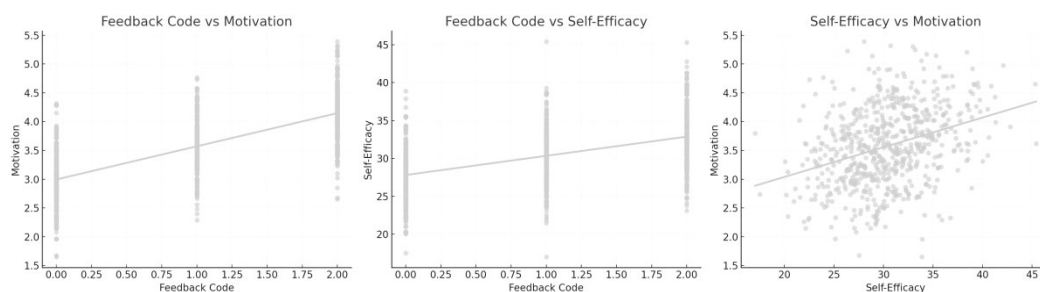


Figure 1 Scatterplot showing relationships between the three variables

Table II shows the mean scores of each feedback group, and from the values in Table II, the scatter plot of the three-variable relationship in Figure 1 can be further plotted, which can clearly demonstrate the scatter relationship between the feedback coding (0=Control Group, 1=Personal Feedback Group, and 2=Process Feedback Group) and the students' learning motivation and self-efficacy. From Table 2 and Figure 1, it can be clearly seen that the regression line in the graph clearly shows the positive correlation trend among the three variables, which verifies the facilitating effect of positive teacher feedback on students' motivation variables.

3.3 Analysis of differences in learning motivation and self-efficacy

Table 3 Results of one-way analysis of variance (ANOVA)

implicit variable	Source of variance	Sum of Squares (SS)	Degrees of freedom (df)	Mean Square (MS)	F-value	Significance (p)
Self-efficacy scores	intergroup	1882.74	2	941.37	32.62	< .001
	within a group	17861.21	623	28.65		
Learning Motivation Score	intergroup	83.41	2	41.70	58.02	< .001
	within a group	447.73	623	0.72		

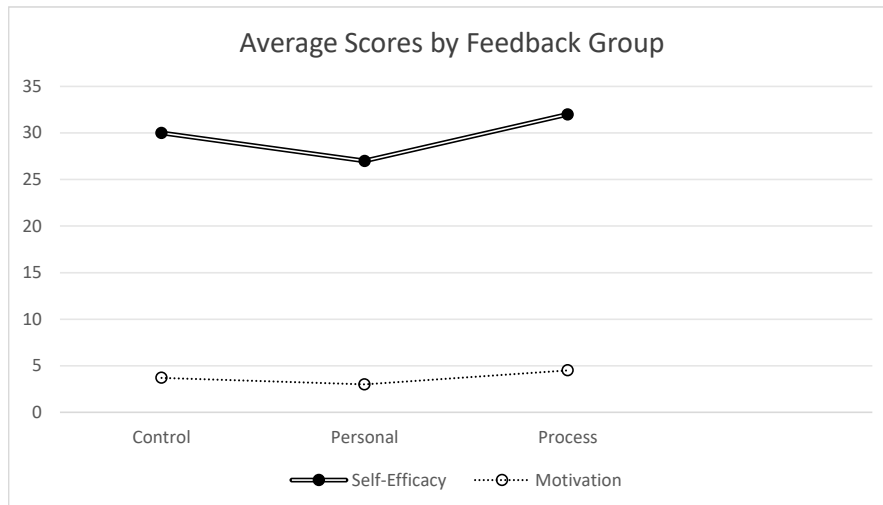


Figure 2 Line graph of average scores of different feedback groups

Figure 2 demonstrates the trend of the mean scores of students in different feedback groups (Control=control group, Personal=personal feedback group, Process=process feedback group) in terms of motivation and self-efficacy. According to Table 3 and Figure 2, the process feedback group scored the highest than the other groups on both dimensions, and the control group scored the lowest, further validating the important influence of the type of feedback

3.4 Data analysis of self-efficacy scores by group

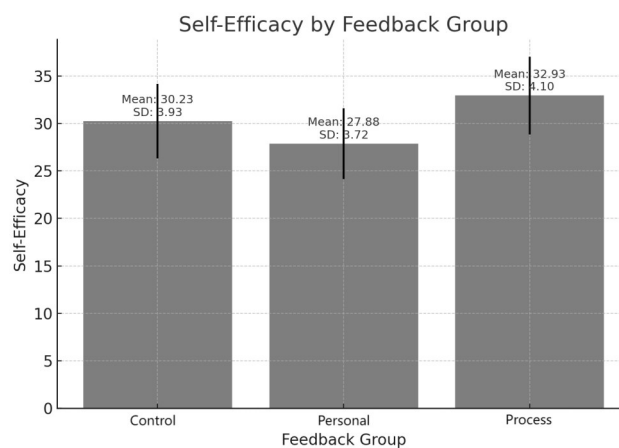


Figure 3 Histogram of self-efficacy scores for different feedback groups

Figure 3 illustrates the means and standard deviations (Mean $\pm$ SD) of the self-efficacy scores of the three groups of students. The horizontal axis uses English labels and includes Control (Control group), Personal (Personal feedback group), and Process (Process feedback group). The results showed that the Process feedback group had higher self-efficacy scores than the other two groups.

4 Intermediation test

In order to understand the relationship between positive teacher feedback, self-efficacy and motivation to learn, this study referred to the mediation analysis proposed by Wenwen Liu et al. (2024). Structural equation modeling was used to test the mediating effect and Mplus 8.5 was used for modeling and index calculation. Positive teacher feedback was a significant positive predictor of self-efficacy ($\beta = 0.48, p < 0.001$). Self-efficacy was also a significant positive predictor of motivation to learn ($\beta = 0.52, p < 0.001$). The study utilized Bootstrap nonparametric bias correction for 1000 replicate samples. The confidence interval for the mediated path was [0.14, 0.29] and did not contain 0, indicating a significant mediation effect.

Table 4 Intermediate effect pathways and effect sizes

pathway relationship	efficiency value	95% confidence interval	Amount of effect (%)
Direct effect: positive teacher feedback $\rightarrow$ motivation to learn	0.32	[0.18, 0.46]	61.54
Mediating effect: positive teacher feedback $\rightarrow$ self-efficacy $\rightarrow$ motivation to learn	0.20	[0.14, 0.29]	38.46
aggregate effect	0.52	-	100

The results suggest that self-efficacy plays a partial mediating role between positive teacher feedback and student motivation. Teacher feedback can directly enhance students' motivation to learn. Feedback can also further promote students' motivation by enhancing their self-efficacy. This result reminds teachers that they should pay attention to both feedback methods and students' psychological state in the classroom.

5 Conclusions and recommendations of the study

5.1 There's three models

Based on 626 valid questionnaires and the relationship between teachers' positive feedback, self-efficacy and learning motivation, this study obtained the following main conclusions through reliability testing, descriptive statistical analysis and structural equation modeling:

(1) Positive teacher feedback has a significant positive predictive effect on students' motivation and self-efficacy, especially "process feedback" is more likely to increase students' psychomotor motivation than "personal feedback" and "control group". In particular, "process feedback" is more likely to increase students' academic motivation than "personal feedback" and "control group".

(2) Self-efficacy plays a partly mediating role between teachers' positive feedback and students' motivation. Teachers' feedback not only directly affects students' motivation, but also indirectly enhances students' motivation by increasing their self-evaluation.

(3) The quality and structure of the feedback method play a decisive role in the effectiveness of feedback. It may be difficult to trigger students' intrinsic motivation by only giving "praising results" or "vague affirmation", while structured feedback can activate students' sense of internal control.

5.2 Teaching recommendations for teachers

5.2.1 Recommendations for teachers' instruction

(1) Focus on the learning process. Evaluation should avoid only recognizing the end result and needs to focus on the efforts and strategies used by students in learning.

(2) Establish a two-way feedback mechanism. Teachers can carry out collaborative evaluation to shift feedback from one-way transmission to teacher-student interaction. Feedback can also be incorporated into the daily teaching process.

5.2.2 Suggestions for students' capacity enhancement

(1) Enhance your understanding of feedback. When receiving evaluations, it is important not to take them at face value. There needs to be a careful understanding of the directions for improvement and suggestions for growth offered by the teacher.

(2) Build self-assessment skills. The habit of reflecting on learning behaviors should be developed in the process of receiving continuous feedback.

(3) Develop a growth mindset. Students should learn to manage their emotions when faced with criticism. They need

to adjust the way they look at things and see feedback as an opportunity to improve themselves. This enhances the ability to cope with difficulties.

5.2.3 Revelations

(1) Enhance understanding of feedback. Students can't just scratch the surface when it comes to receiving evaluations. They need to carefully understand the directions for improvement and suggestions for growth offered by the teacher. This will enable them to proactively adjust their learning strategies.

(2) Build self-assessment skills. Students should develop the habit of reflecting on their learning behavior in the process of receiving continuous feedback. They can gradually improve their self-regulation mechanism and goal management, as well as enhance their sense of self-efficacy.

6 Conclusion

It has been found that teachers' positive evaluation can effectively motivate middle school students. Students' self-efficacy plays a mediating role in this process. In the process of teaching, teachers need to pay attention to the way and frequency of feedback, and stable and targeted positive evaluation can help enhance students' motivation. Feedback should be specific and directed to students' actual performance in learning. Similarly teachers can use interactive activities such as situational simulations and case studies to let students clearly see their progress and changes in their abilities. Schools should establish appropriate support mechanisms. Specialized training can be carried out to facilitate the sharing of teaching experience and promote cooperation and exchange among teachers. Intelligent teaching tools can also be introduced to provide technical support for personalized feedback. This study further illustrates the mechanism of positive teacher feedback on student motivation. Future research can continue to explore how this mechanism manifests itself in different disciplines and cultural contexts.

References

- [1] Cao Zhenpeng, Jin Xinglong, Wang Xiaoyan. A study of the relationship between motivation to learn chemistry and laboratory safety awareness and attitude among freshmen students[J]. *Chemistry Education (in Chinese and English)*, 2022, 43(8): 111-117.
- [2] ZHU Mingjian, QIN Haozheng. A review of domestic research on motivation to learn chemistry in the past ten years[J]. *Chemistry Teaching*, 2013(10): 13-16.
- [3] Yao Weijia. A study of the relationship between teachers' positive feedback and first-year students' frustration response patterns [D]. Hunan Normal University, 2021.
- [4] Hattie J., & Timperley H. The Power of Feedback. review of Educational Research, 2007, 77(1), 81-112.
- [5] JIANG Jinwei, HAO Xiaofeng. The effects of praise and criticism on junior high school students' learning engagement[J]. *Journal of Xinyang Normal College (Philosophy and Social Science Edition)*, 2014, 34(3): 13-17.
- [6] Lu Lili . Research on Early Childhood Teachers' Praise Behavior--Taking Wuhan A Garden as an Example . Master's thesis, Central China Normal University .2014.
- [7] Skipper Y, Douglas K. The influence of teacher feedback on children's perceptions of student-teacher relationships[J]. *British Journal of Educational Psychology*, 2015, 85(3): 276-288. Cavanaugh B. Performance Feedback and Teachers' Use of Praise and Opportunities to Respond: a Review of the Literature[R]. 2013. [Online]. Available: <https://www.researchgate.net/publication/265980001>.
- [8] Morris, B. J., & Zentall, S. R. High fives motivate: the effects of gestural and ambiguous verbal praise on motivation. *Frontiers in Psychology*, 2014, 5, 928.
- [9] YuKehong, LuYijuan, WuYizhuo. Structural equation modeling analysis of factors influencing college students' exercise behavior[J]. *Journal of Physical Education*, 2021, 28(2): 103-109.
- [10] Black P., & Wiliam D. Assessment and Classroom Learning. *Assessment in Education: Principles, Policy & Practice*, 1998, 5(1), 7-74. Crooks T. J. The Impact of Classroom Evaluation Practices on Students. review of Educational Research, 1988, 58(4), 438-481.
- [11] SotoudehnamaE., & MolaviM. The Effects of Teachers' Written Comment Types and Iranian EFL Learners' Attitudes. *the Journal of Asia TEFL*, 2014, 11(4), 21 -21.
- [12] BoudD., & DawsonP. What feedback literate teachers do: an empirically-derived competency framework. *Assessment & Evaluation in Higher Education*, 48(1), 1 Assessment & Evaluation in Higher Education, 2023, 48(1), 1 -15.