

Comparative Study on Classroom Teaching Language for Novice Teachers and Proficient Teachers of Middle School Mathematics

Qing Li^{1, a}

¹School of Communication, Jiangxi Normal University, Nanchang, China.

^a1984326194@qq.com

Abstract

The classroom teaching language is the carrier of teaching information and the bridge of communication and interaction between teachers and students. The Flanders interaction analysis system is used in this paper to compare and analyze the classroom teaching language of middle school mathematics novice teachers and proficient teachers from four aspects: classroom structure, teachers' language style, classroom emotional atmosphere and language interaction between teachers and students. In order to promote the professional development of novice teachers and speed up the process of transition from novice teachers to proficient teachers, some suggestions are given to improve the teaching language of novice teachers.

Keywords

Novice teachers, Proficient teachers, Classroom teaching language, Flanders interaction analysis.

1. INTRODUCTION

According to Lasswell's 5W model, teachers teach students the course content through teaching language in teaching activities, and the degree of students' acceptance of teaching information reflects the teaching effect of teachers. Therefore, the expression of teachers' teaching language affects the teaching effect. Compared with the novice teachers, the proficient teachers are more able to grasp the art of teaching language. They use classroom teaching language to promote interaction with students to ensure the fluency of the classroom and optimize the teaching effect. In order to promote the growth of novice teachers in teaching language, it is necessary to find out the characteristics of teaching language of proficient teachers, and to study the differences between novice teachers and proficient teachers.

2. STUDY DESIGN

2.1. The Research Objects and Contents

"Standards and guidance for primary and secondary school teachers' professional development" points out that the process of teachers' growth is a process from novice teachers to proficient teachers, and then from proficient teachers to expert teachers. It defines the standard for the type of teachers. The criteria for novice teachers: graduated from normal colleges and participated in educational practice, engaged in teaching for 1-3 years. The standard of proficient teachers: teachers with teaching experience of 10-15 years, with intermediate titles in middle schools, and who have participated in backbone teacher training or subject leader training [1]. The research objects are selected on the national public platform of education resources, "One Teacher and One Excellent Course". The proficient teacher is a senior middle school teacher who has been teaching for 12 years. He is also the leader of the

seventh grade mathematics lesson preparation group, and has won the title of backbone teacher for many times. The novice teacher is a normal student who graduated from mathematics education major. He once had the experience of education practice. Now he is the first year on the post of teacher. The content taught by the two teachers is the fifth chapter of the second volume of the seventh grade of junior high school mathematics, "Intersection line and parallel line".

2.2. The Research Methods and Purposes

According to the classroom teaching record and the teaching design and courseware uploaded by teachers, quantitative and qualitative analysis are carried out. Through classroom observation, the teacher's language expression and the interaction between teachers and students are observed. By using Flanders analysis system to classify and quantify teachers' classroom behavior, the differences of language expression characteristics between novice teachers and proficient teachers in classroom teaching are obtained.

2.3. The Research Process

The Flanders interaction analysis system studies the language of teachers and students in classroom teaching, encodes and records the speech of teachers and students, and then analyzes it with matrix analysis method [2]. The encoding software is flash light video analysis system developed by Beijing Normal University. The coding classification as follows.

Table 1. The coding table of Flanders analysis system

classification	coding description	classification	coding description
1.teaching language	(1) feeling of acceptance	2.student language	(9) students speak passively
	(2) praise or encourage		(10) students speak actively
	(3) accept students' opinions		(11) ask questions actively
	(4) ask open-ended problem		(12) group discussions
	(5) ask closed-ended problem	3.quiet	(13) silence or confusion
	(6) explain		(14) consider problem
	(7) give instruction		(15) do exercises
	(8) criticize or maintain authority	4.technology	(16) teacher manipulation technology
		(17) student manipulation technology	

The system encodes according to certain coding standards, samples the classroom teaching behaviors every 3S, and selects the most representative behaviors to code. The encoding rules listed in this paper encode the two classroom teaching videos. The teaching video time of the proficient teacher is 39 minutes, and 751 codes are generated; the classroom teaching time of novice teachers is 30 minutes, and 608 codes are generated. The matrix diagram as follows.

Table 2. The analysis matrix of classroom interaction of the proficient teachers

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	13	8	6	2	1	6	5	0	0	1	0	2	0	0	1	1	0
2	8	18	5	1	0	5	1	0	0	3	0	4	0	0	0	4	0
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	0	1	1	6	2	1	1	0	2	3	0	0	0	0	1	1	0
5	0	0	0	2	2	3	1	0	5	14	0	1	1	1	0	5	0
6	8	4	5	2	8	44	11	0	1	8	0	0	1	0	0	17	0
7	6	2	1	2	5	13	26	0	2	13	0	6	1	1	1	7	3
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	2	3	3	0	1	0	6	0	14	3	0	0	0	0	0	0	0
10	5	3	11	3	8	12	8	0	4	31	1	2	0	0	0	6	1
11	0	1	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0
12	0	2	1	0	0	1	8	0	1	2	1	73	0	1	1	0	0
13	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0
14	0	0	0	0	0	0	1	0	1	1	0	2	0	11	3	0	0
15	0	1	0	0	1	0	1	0	0	1	0	0	0	3	24	1	0
16	2	2	2	1	2	10	6	0	1	10	0	1	0	0	0	20	3
17	0	0	0	0	1	0	2	0	0	0	0	0	0	1	1	3	7

Table 3. The analysis matrix of classroom interaction of the novice teachers

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	0	3	0	0	0	4	1	0	1	1	0	0	0	0	0	0	0
3	0	1	10	0	1	4	2	0	0	0	0	0	0	0	0	1	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	5	2	2	1	20	1	0	0	0	0	1	0	0
6	0	4	1	0	14	163	10	0	11	7	0	1	2	0	1	4	0
7	0	1	1	0	8	15	24	0	5	0	0	3	3	0	3	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
9	1	1	6	0	2	16	11	0	25	3	0	0	0	0	1	0	0
10	0	0	1	0	2	6	3	0	1	8	0	1	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	1	5	1	0	0	0	0	0
12	0	0	0	0	0	1	2	0	1	0	2	62	0	0	0	0	0
13	0	0	0	0	0	2	3	0	0	0	0	0	7	0	1	0	0
14	0	0	0	0	0	0	1	0	0	0	0	0	0	20	1	0	0
15	0	0	0	0	1	1	4	0	2	0	0	0	0	1	48	0	0
16	0	0	0	0	0	4	0	0	1	0	0	0	1	0	0	2	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. THE ANALYSIS OF THE RESEARCH RESULTS

3.1. The Comparative Analysis of Classroom Teaching Language Between Novice Teachers and Proficient Teachers

(1) The differences in classroom language structure

(a) The proportion of teacher language

In the proficient class, the language of teachers accounts for 49.4% and that of students accounts for 30.75%. In the class of novice teachers, teacher language accounts for 59.86% and student language accounts for 21.3%. The language proportion of both teachers is larger than that of students, indicating that teachers occupy the dominant position in the classroom. The democratic and open classroom requires that the teacher's language should be less than 60%, and the student's language should be more than 20%. Therefore, both classes are democratic and open. However, according to the actual classroom observation, the novice teachers' teaching time occupies the majority of the classroom, and students passively accept the learning content. And the proficient teachers tend to give the classroom to students and design many activities for students to participate in discussions. While the teacher act as the guide of students' learning.

(b) The proportion of student language

The language proportion of both students is 30.75% and 21.3% respectively. Among them, active speech accounted for 12.5% and 3.6%, while passive speech accounted for 4.5% and 10.9%. It can be seen that students are willing to take the initiative to exchange their views and doubts with teachers in the classroom of proficient teachers, which also shows that they can properly mobilize the enthusiasm and participation of students. On the contrary, in the class of

novice teachers, the proportion of students' passive response is higher than that of students' active speech. Students lack the consciousness of active questioning and teachers lack the ability to mobilize students' enthusiasm. Teachers completely dominate the class and lead students' thinking.

(c) The proportion of silence

The proportion of silence in the classroom reflects the utilization rate of the classroom. The proportion of the two teachers' unhelpful language is 0.93% and 2.1%, respectively. There are few chaotic language interactions in the classroom of proficient teachers, but more of them are conducive to classroom language interactions, which shows that the teaching experience and classroom management technology of proficient teachers make the classroom orderly. Through observation, it is found that some teachers' irrelevant language and students' confusion will appear in the novice teachers' classroom, which indicates that the novice teachers' control of the classroom is insufficient, and their professional teaching skills need to be strengthened. In the proportion of silence that helps teaching, the proportion of proficient teachers and novice teachers is 5.58% and 4.52% respectively. It shows that both teachers have left enough time for students to think about the new knowledge and do some exercises for consolidation and internalization.

(2) The differences in teaching style and language tendency

(a) The direct influence and the indirect influence

The ratio of indirect influence and direct influence of proficient teachers and novice teachers are 0.91 and 0.26 respectively. The proficient teachers pay more attention to the guidance of students, rather than give the answer directly. For example, when explaining exercises, the proficient teacher gives students enough time to think and guide them to solve problems step by step. However, the novice teachers explain directly after asking questions, and do not give students time to think, resulting in students' mastery of knowledge only stays at the level of memory, without building their own knowledge structure.

(b) The positive effects and the negative effects

The ratio of positive effects and negative effects of proficient teachers and novice teachers are 9.5 and 2.3 respectively, both of which are greater than 1, indicating that the positive influence of the two teachers' teaching language behavior on students, but there is still a big gap between them. Among them, the proportion of praise or encouragement behavior is significantly different, which is 6.3% and 1.64% respectively; the proportion of accepting students' opinions is 5.05% and 2.1% respectively. Through the observation of classroom teaching records, it is found that the proficient teachers are good at using praise or encouraging words to affirm students' answers and encourage them to express themselves actively.

(3) The differences in emotional atmosphere

The positive case reflects the harmonious emotional atmosphere between teachers and students; the defective case indicates the emotional estrangement between teachers and students. The positive rate of proficient teachers and novice teachers is 8.92% and 2.46% respectively, while the defect rate is 0 and 0.82% respectively. The ratio of positive case is greater than that of defect case, and the emotional atmosphere is better. However, it can be seen from the density of recording times that the emotional atmosphere of the proficient teachers is more harmonious. Teachers' encouragement, praise, questioning and other behaviors stimulate students' interest in learning. Students actively participate in the interaction, and the whole classroom presents a good atmosphere. Moreover, the proficient teachers rarely use directive language, but use words of respect for students to promote the establishment of mutual respect, democratic and equal relationship between teachers and students. While the novice teachers

have less emotional interaction between teachers and students in the classroom. Although they can ask questions, they lack feedback.

(4) The differences in language interaction

(a) The type and frequency of questions

The proportion of open questions and closed questions raised by the proficient teachers is 3.92% and 4.66% respectively, while the novice teachers are 0 and 5.3% respectively. The proficient teachers are good at teaching by asking questions, and pay attention to the design of open questions. It shows that the proficient teachers can fully mobilize the enthusiasm of students, explore the potential of students, and develop students' thinking. The novice teachers' questions are all closed questions. Students do not need to think through the brain and their enthusiasm is also not high. The novice teachers pay attention to transfer knowledge to students, but ignore the way of students' knowledge acceptance, and limit the learning content to textbooks.

(b) Students' passive answer and active speech

In the classroom of proficient teachers, the proportion of passive speaking and active speaking is 4.5% and 12.5% respectively. In the classroom of novice teachers, the proportion of them is 10.8% and 3.6% respectively. It can be seen that the proficient teacher's classroom students take the initiative to speak a lot, students are willing to take the initiative to exchange their views and doubts with the teacher, which also shows that the proficient teacher can properly mobilize the enthusiasm and participation of students. On the contrary, in the class of novice teachers, the proportion of students' passive response is higher than that of students' active speech, which indicates that students lack the consciousness of active questioning. Teachers completely dominate the class and lead the students' thinking.

3.2. The Teaching Language of Novice Teachers

(1) Too much control of the right to speak, occupy the dominant position in the classroom

The novice teachers have been in the teaching state in the teaching process, the whole classroom presents a "cramming" teaching phenomenon, students have been in a passive state, teachers occupy the dominant position in the classroom. This is due to the novice teachers do not understand the cognitive characteristics of students, the control of class learning situation is not enough, ignoring the physical and mental development of students. At the same time, the novice teachers explain directly after asking questions, which also leads to students' unclear knowledge acceptance and misunderstanding.

(2) Lack of interaction between teachers and students, lack of encouragement and feedback language

The novice teachers pay too much attention to their own teaching content and behavior, ignoring students' feelings and psychological state as learning subjects, resulting in less communication between teachers and students, and the effectiveness of interaction is not high. They only pay attention to the teaching content, but ignore the students' mastery of the content. At the same time, the novice teachers ignore the importance of encouraging response to enhance students' self-confidence.

(3) There are few questions in class, and the effectiveness is not high

The novice teachers' classroom questions are less, and most of them are closed questions. They ignore the subject characteristics of mathematics and can not effectively stimulate students' interest in learning mathematics. Because answering these memorizing questions does not need to think through the brain, students' thinking ability and cognitive level can not be improved. There are few open questions in novice teachers' classroom, which indicates that their ability to design problems needs to be improved.

(4) The use of teaching language is single and the expression is not accurate

The novice teachers often have inaccurate language expression in the process of teaching. Mathematics, as a rigorous discipline, has high requirements for the accuracy and logic of teachers' language use [4]. The novice teachers' teaching language is relatively straightforward, without highlighting the key points. They are used to using declarative language, ignoring the importance of intonation and mood to the classroom teaching atmosphere, which leads to monotonous classroom teaching atmosphere and students' inattention.

4. CONCLUSION

(1) Optimize the classroom structure, give full play to teachers' guiding role, and clarify the students' dominant position

In order to enhance the language interaction between teachers and students and improve the effectiveness of classroom teaching, firstly, teachers must clarify the status of students as the main body of learning, gradually relax the control of language in the classroom, and listen to students' ideas more. Secondly, teachers should "decentralize" the students, give them as many opportunities as possible to express their ideas, change the concept that teachers are the master of the classroom, and gradually realize the role transformation of the guide, helper and learning partner.

(2) Reasonable design of teaching activities to stimulate students' interest in learning

In order to improve students' interest in learning, it is necessary to let students learn in pleasure and create a harmonious and interesting classroom teaching atmosphere. Teachers are required to adopt flexible and diverse teaching methods and design rich teaching activities, which can be used for reference by experienced teachers in the context introduction link and use the video of magic performance to arouse students' curiosity and curiosity. Using mind map to present knowledge content. In the discussion section, the game is used to let students immerse themselves in the real situation of problem-solving.

(3) Design questions carefully to improve response effectiveness

Teachers design inspiring problems according to students' recent development area and individual cognitive level, and design some hierarchical problems combined with the difficulty of knowledge content. Students can solve problems step by step under the guidance of teachers. For example, when the teaching content has a certain degree of difficulty, teachers can design a series of problems according to the degree of difficulty, so that students can gradually improve their cognition and divergent thinking; when the teaching content is relatively simple, the difficulty of the problem should be appropriately adjusted to stimulate students' interest and give them encouraging feedback to make them full of learning achievement.

(4) Strengthen mathematical language training and attach importance to implicit language

Different from other subjects, mathematical language requires higher logic and rigor [5]. The novice teachers don't pay much attention to language expression, and students feel boring and general to mathematics class. As a mathematics teacher, we should strengthen the training of mathematics language standard and improve the ability of mathematical language expression. It is required that the teaching language should be accurate, logical, loud, moderate speed, fluent sentences and intonation.

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