Research on Artificial Intelligence Classroom Teaching Intelligence Evaluation System (CSMS) in school classroom teaching quality management

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Abstract. In order to effectively grasp the quality of classroom teaching, improve teachers' professional quality and ability, and help teachers' professional growth, the collaborative application of classroom teaching wisdom evaluation system (CSMS) and learning generation knowledge and action theory can promote classroom transformation. Taking Banxi Primary School in Guangdong Province as an example, this paper aims to introduce how to use the structure-based multi-model combined classroom teaching evaluation system (CSMS). 33 teacher samples participated in big data analysis, distributed in 4 disciplines, and 50 classroom recordings, to diagnose the overall situation of regional and school classroom teaching quality. In order to improve the pertinence of regional and school teacher team management and construction, to help school teachers achieve better professional development.

Key words. Classroom Teaching Intelligence Evaluation System;teaching quality management;9 scoring areas;

1. Introduction

With the advent of the era of artificial intelligence, various fields of society such as medical care, economy, education, culture and other aspects have been impacted by artificial intelligence technology[1]. As the product of social development to a certain form, traditional school education can no longer meet the challenges of artificial intelligence technology. In the "New Generation of Artificial Intelligence Development Plan" issued by The State Council, it is clearly pointed out that the artificial intelligence education system should be improved, which also accelerates the implementation and landing of artificial intelligence technology in the field of education.

How to implement the cultivation of students' core accomplishment in the regular classroom has become the focus of teaching and research in the subject group of primary and secondary schools. In this paper, a sample of 33 teachers from Bangxi Primary School in Guangdong Province participated in big data analysis of 4 subjects, including Chinese, mathematics, art and music, covering different levels of new teachers and excellent teachers. The course covers all grades from Grade 1 to Grade 6 of primary school, and a total of 50 class transcripts were collected. the classroom structure-based multi-model-supported scoring system (CSMS) [2-4] was adopted to comprehensively analyze 40 quantitative indicators. CSMS excludes the logic part of subject knowledge, divides classroom teaching activities into four dimensions, namely,

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organizational regulation, cognitive thinking, emotional integration and goal achievement, and constructs nine scoring fields of classroom teaching evaluation according to the dominant - subject teaching structure theory and the third generation activity theory[5]. It has established an index system and system that can normalize and scale classroom teaching by using artificial intelligence technology[6-7]. The main objective is to encourage classroom interaction, encourage classroom democracy, encourage the balance of multiple thinking, essentially promote the cultivation of critical thinking and innovative thinking, and encourage students to develop together[8-10]. The structure-based multi-model combined classroom teaching evaluation system brings the possibility to solve the big data dilemma of Bangxi Primary School.

2. Method

CSMS is a big data classroom assessment tool that uses artificial intelligence to achieve automatic scoring. It is teacher-led and student-dominated. From two perspectives, the classroom is divided into 9 scoring areas: goal orientation, classroom art, classroom regulation, thinking stimulation, evaluation feedback, overall development, cooperation and communication, learning experience and goal achievement, corresponding to 9 indexes. Each index is composed of 3~6 different sub-indexes, totaling 40 sub-indexes. The core focus of the CSMS is critical thinking, communication, collaboration, and creativity. Therefore, from the perspective of classroom teaching structure, this paper divides 40 detailed indicators in CSMS into two categories: thinking stimulation and communication interaction. The classroom teaching wisdom evaluation system focuses on the four core qualities of the classroom: innovative thinking, critical thinking, communication literacy, cooperation literacy; The accurate analysis from teacher-led (5 indexes) and student-dominated (4 indexes) provides the direction for the integrated research of teaching evaluation in large units.

3.Results and analysis

3.1 CSMS score distribution of Chinese and mathematics subjects

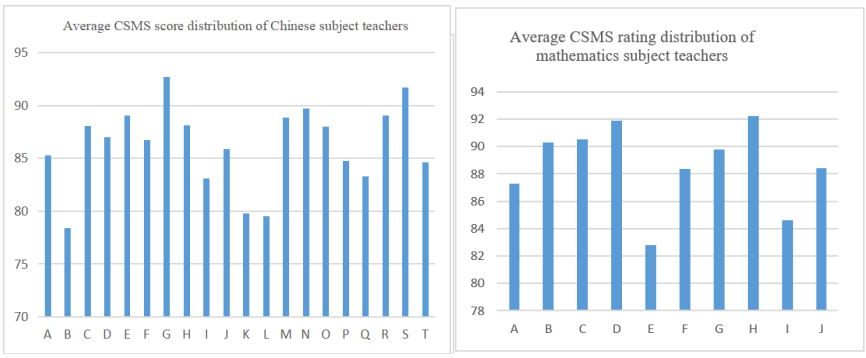

Figure 1 Taking Chinese subject and mathematics subject as examples, the characterization of classroom teaching characteristics by CSMS score is verified. The horizontal axis is the teacher number, and the vertical axis is the average CSMS rating of the teacher.

The CSMS evaluation involves 40 quantitative indicators, a comprehensive quantitative analysis of the degree of conformity between the classroom and the main thrust objectives encouraged by the CSMS. This study first verifies whether the results of CSMS rating on teaching style are consistent with the school's perception of teachers' experience. With the exception of music and art, a number of teachers were assigned to each subject in the sampling design, and the scores of each teacher in multiple classes were averaged and verified by Byxi School according to subject (Figure 1). The experiment shows that CSMS can describe the teaching characteristics of teachers well.

3.2 Distribution of CSMS76-94 scores in the west

For the overall insight distribution of classroom teaching characteristics in Bangxi Primary School, the CSMS scores of all classroom samples are shown in Figure 2. As can be seen from the distribution map, the classroom rating roughly presents a negative skew distribution, with 25% concentrated between 88 and 91.

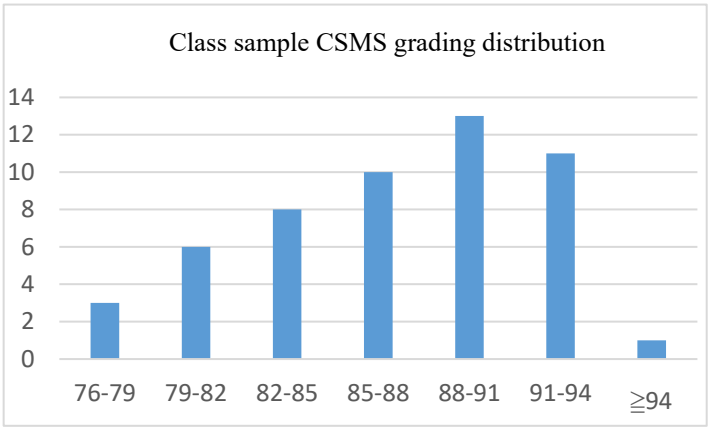

Figure 2. CSMS grading distribution of all classroom samples in Bangxi Primary School. The horizontal axis is the score interval, and the vertical axis is the number of samples in this interval.

3.3 Nine scoring areas of the Western CSMS (average, highest, lowest)

The situation of nine scoring areas of CSMS in Bangxi Primary School is shown in Figure 3.

On average, the classroom is relatively weak in the three aspects of goal achievement, classroom regulation and cooperation, while it is relatively good in the four aspects of goal positioning, overall development, classroom art and learning experience. The class with the highest CSMS rating was the Chinese class, with balanced high scores in all nine grading areas, and the teacher's other classes showed similar characteristics. The lowest CSMS rating was also low for a Chinese class in all areas except goal orientation, learning experience, and evaluation feedback. The teacher for this class was similar to the other classes, and the teacher was a new teacher.

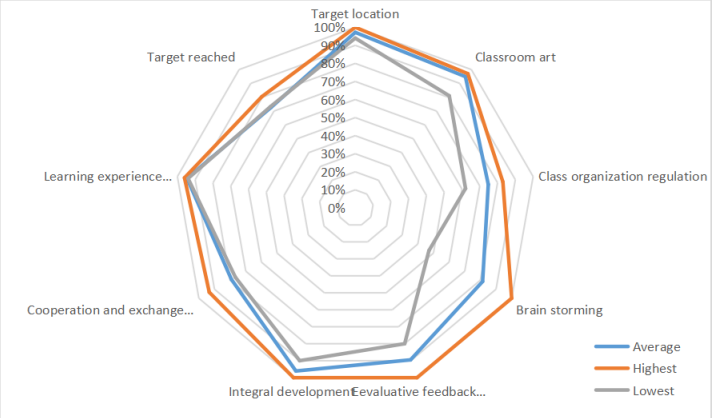

Figure 3 Nine scoring areas of the CSMS in Bysai Primary School

3.4 The average situation of nine areas of the west, one division and one excellent course

The comparison between the average scores of the nine scoring areas of the CSMS in Bangxi Primary School and the CSMS is shown in Figure 4. On average, the target orientation and learning experience of the sample of Bangxi Primary School are higher than that of the excellent curriculum of the first teacher and one Excellent course, 8% and 1% respectively. Overall development and goal achievement are consistent with the excellent courses of one teacher and one excellent course, 96% and 73% respectively. The other five scoring areas are all lower than the one teacher one Excellent course. In the three scoring areas of classroom control, cooperation and communication, and goal achievement, the scores were relatively low, ranging from 73% to 84%.

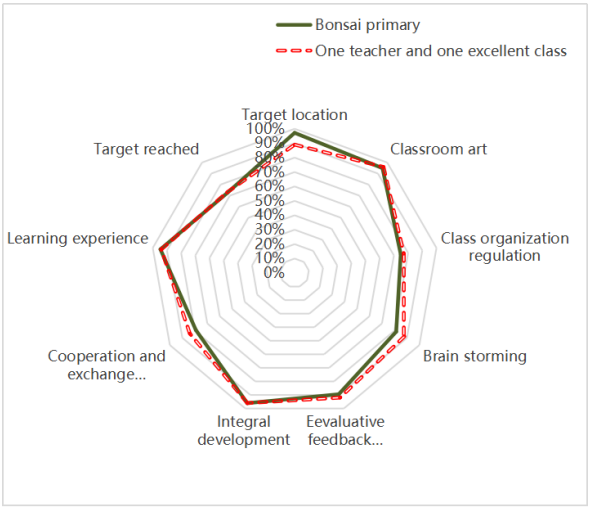

Figure 4 Comparison of the average scores of the One Teacher, One Excellent Curriculum and the nine scoring areas of the CSMS of the Bun Sai Primary School

3.5 key impacting indicator

The CSMS evaluation observed that the three aspects of classroom goal positioning, classroom regulation and cooperation and communication were relatively weak, and further analysis of significant influencing factors was needed to provide accurate methods for changing the classroom. Table 1 summarizes the main influencing factors from up to 100 dimensions of big data analysis: the intensity of know-action teaching style, classroom control, speech speed, four-dimensional balance of course structure design, student speaking time, etc.

Table 1: Analysis of big data influence factors on classroom teaching in the whole sample of Bangxi Primary School

Impact Factor	The intensity of the know-doing teaching style	Classroom control	Speech speed (words/min)	Four-dimensional equilibrium of curriculum structure design				Four-dimensional clarity of curriculum structure design	Total student speaking time (s)	Speaking time per student (seconds)	
				What if	why	What	how			longest	mean
mean	0.21	28	216	29%	14%	36%	21%	74	1131	64	6.5

The intensity of knowledge-action teaching style is based on the distribution of four ways of teachers' classroom knowledge transfer: conceptual abstraction (what), scene assumption (what if), why (why), and how (how), so as to calculate the degree of deviation from zero, which is used to measure the degree of teachers' classroom knowledge transfer in a certain way. A smaller value indicates that the teacher's teaching style is better able to accommodate students with different learning styles. The average intensity of know-action teaching style is 0.21, which is generally strong. From the four-dimensional equilibrium of curriculum structure design, the bias to "is" is obvious. These two indicators jointly point to the teaching style of teachers' groups that is biased toward "what is", that is, toward the explanation of knowledge concepts. The overall fast speaking speed (216 words/min), combined with the teaching method biased towards "what is", indicates that teachers have long formed a sense of urgency and need to transfer a large amount of knowledge to students to complete the teaching task.

A total of 12 classrooms with a CSMS evaluation score of 90 or above belong to the classes that are more in line with the CSMS evaluation objectives. The average intensity of the teaching style of these classrooms is 0.22. How: Why: how: How =26% : 17% : 37% : 20%, the speaking speed of 229 words/minute, the overall is still biased towards the "is" way, but the various knowledge transmission methods are relatively balanced, the thinking clarity of the course structure design is 101, compared with the 90 points less than 55%. As shown in Table 2.

Table 2: Comparative analysis of classroom big data impact factors with CSMS evaluation scores of 90 and above and below 90

Impact Factor	The intensity of the know-doing teaching style	Classroom control	Speech speed (words/min)	Four-dimensional equilibrium of curriculum structure design				Four-dimensional clarity of curriculum structure design	Total student speaking time (s)	Speaking time per student (seconds)	
				What if	why	What	how			longest	mean
Over 90	0.22	33	229	26%	17%	37%	20%	101	1110	43	5.4
Below 90	0.21	26	211	31%	13%	35%	22%	65	1137	71	6.8

4. Conclusion

In this paper, teaching is carried out based on situational knowledge, and the teaching activities are designed in the way of problem string, aiming to cultivate students' thinking, reasoning, judgment, expression and active learning attitude in the process of solving specific problems, which better reflects the teaching requirements of the era of actively implementing students' core literacy in the classroom.

The core of changing education is to change the classroom, and the core of changing the classroom is to establish the feedback evaluation mechanism of the classroom. The collaborative use of classroom teaching Wisdom Assessment System (CSMS) and learning generation knowledge and action theory can promote classroom transformation. 33 teacher samples participated in big data analysis, distributed in 4 disciplines, and 50 classroom records. Compared with the national level of one teacher and one excellent course, the target positioning and learning experience are higher than the national level.

The application of artificial intelligence CSMS system improves the educational evaluation system and mechanism, improves the comprehensive classroom evaluation of teachers, guides teachers to improve the direction of classroom teaching, and leads the professional growth of teachers.

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