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Research on high school mathematics evaluation from the perspective of core literacy

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Abstract
From the end of 2017, the evaluation based on core literacy has become the focus of research in core literacy. This paper analyzed the connotation of core literacy, the characteristics of current high school mathematics assessment, and the requirements for high school mathematics evaluation in the "High School Mathematics Curriculum Standard". From the aspects of evaluation indicators, content, objects, methods, presentation and functions, the author put forward suggestions for evaluating students' core literacy of mathematics.

Keywords: core literacy, high school mathematics assessment, evaluation suggestion

1. Introduction
The 2017 High School Mathematics Curriculum Standard proposes three ways to cultivate students' core literacy: curriculum reform, teaching practice and educational evaluation framework. Mathematics evaluation based on core literacy after the introduction of the Standard has received wide attention. On the one hand, the core literacy-based high school mathematics assessment can better implement the core literacy-based mathematics assessment into the actual teaching evaluation. Therefore, teachers can further promote the cultivation of students' core literacy according to the shortage of students, and provide talents for the society to adapt to social development. On the other hand, the research on high school mathematics assessment based on core literacy can also evaluate and select talents in many aspects. People who have learned from different aspects can enter different fields and adapt to the needs of the society, so that they can make the best use of their talents.

2. The essence of core literacy
Since 1997, the National Development and Reform Commission issued the "Several Opinions on Actively Promoting Quality Education in Primary and Secondary Schools", stating that "focusing on the long-term development of educated people and society. To improve the basic quality of students as a whole for all students, China has opened the curtain of quality education. Since then, the State Council and the Ministry of Education have successively issued a number of documents. The country has invested in the enthusiasm for quality education, but now it has become a new craze in core literacy. So what is the difference between core literacy and quality education? Why did the core literacy again be raised after the comprehensive development of quality education? What is the meaning of core literacy?
We can find answers in some important mathematics education discourses. The core literacy is discussed in Core Compendium and Reconstructing the Future Education Vision. “Different from the concept of general literacy, core literacy refers to the students must have their own qualities and key abilities to meet the needs of lifelong development and social development.” In Wang Hong's "Let's slow down the knowledge, return to the core foundation", the core literacy is more specifically discussed. Wang Hong believes that the times are developing and the society is improving. The quality education applied to the past society has no longer applied to today's society, which further promotes the emergence of new things, so the concept of core literacy comes into being. It can be seen that quality education grasps the comprehensive development of students, and core literacy grasps the ability of students to adapt to society and future life. It is the focus of quality education. Core literacy is dynamic. It is the unity of knowledge and skills, mathematical thinking, problem solving, and emotional attitude under mathematics education. It is the key content and core competitiveness of the future service for students (Wang, H. & Wu, Y. M., 2015) [1].

3. Current characteristics of high school mathematics assessment
3.1 Requirements for mathematical evaluation of high school mathematics curriculum standards
In the new "High School Mathematics Curriculum Standard" in 2017, it is pointed out that mathematics assessment should pay attention to students' mastery of specific content, the different characteristics and requirements of the core literacy of mathematics disciplines, and the comprehensiveness and integrity of the core literacy of mathematics disciplines. In addition, the "High School Mathematics Curriculum Standard" also indicates that the function of mathematics assessment is to examine the effectiveness of student learning, to examine the effectiveness of teacher teaching, to diagnose the advantages and disadvantages of students in the learning process, and to diagnose the advantages and disadvantages of teachers in the teaching process. Therefore, the teacher combines the corresponding teaching content, implements the "four basics", cultivates the "four energies", and promotes the

formation and development of the core literacy of the students' mathematics disciplines to reach the corresponding level, and some students can reach a higher level.

3.2 Characteristics of high school mathematics assessment

3.2.1 Test Content

China's high school mathematics curriculum standards have a tradition of focusing on basic knowledge and basic skills. Therefore, in the assessment content, China focuses on the students' mastery of basic knowledge and basic skills, but does not really implement the students' mathematics learning methods, ability development and improvement, emotional attitudes and values.

3.2.2 Test Method

China's high school mathematics assessment mainly uses nominative assessment in the evaluation method, and examines the content of students' learning at the end of educational activities. This kind of evaluation is carried out at the middle of the period, at the end of the period or at the end of the school year. The purpose is to comprehensively understand and identify the students' learning outcomes, and check the results of the teaching work to achieve the expected goals by comparing the evaluation indicators of the teaching objectives. In the evaluation method, the paper-based test is mainly used. This test method can quickly and easily examine the mastery of students' knowledge and skills. However, it ignores the development of students' mathematical abstraction, logical reasoning, mathematical modeling, mathematical operations, visual imagination and data analysis, which are difficult to quantify and have a significant role in the future development of students. In other words, the high school mathematics assessment results in a light process that does not develop with the development of educational priorities and requires further reform.

4. Suggestions on the implementation of high school mathematics assessment based on core literacy

4.1 Comprehensively examine core literacy and promote student development

Influenced by China's traditional attention to "double base", China's high school mathematics assessment focuses on the basic knowledge and basic skills of students, neglecting the investigation of students' mathematics thinking, problem solving and emotional attitude. The test paper rarely examines students from the perspective of core literacy, so that the evaluation of students only stays on the test paper, staying in the mathematical world extracted by the test papers. Students can get high scores in the test paper, but it is difficult to get high scores in real life and real problems. In other words, at present, mathematics tests in China pay more attention to the cultivation and evaluation of students' ability to solve problems, ignoring the cultivation of the ability to ask questions.

The core literacy of mathematics includes mathematical abstraction, logical reasoning, mathematical modeling, mathematical operations, visual imagination and data analysis. Therefore, in order to measure the development of students' core literacy and promote the improvement of students' six abilities, these six indicators are needed for evaluation. Among them, the current high school mathematics evaluation pays more attention to the students' logical reasoning, mathematical operations, visual imagination and mathematical abstraction. For example, the three-dimensional geometry in the high school mathematics enables students to use space to understand the positional relationship, morphological changes and movement laws of things, promoting the development of students' geometric and visual imagination. However, the evaluation has less research on students' mathematical modeling ability. It lacks students' mathematical abstraction of real problems, expresses problems in mathematical language, and constructs models to solve problems using mathematical knowledge and methods. Therefore, we should not consider this in the evaluation indicators. We should comprehensively examine the six core literacy of mathematics. The indicators that have been evaluated are still developing. For the untested, the evaluation should be further strengthened to further promote the comprehensive implementation of the core literacy of students.

4.2 Evaluate student literacy and improve teacher teaching

The "High School Mathematics Curriculum Standard" requires the purpose of evaluation to diagnose the advantages and disadvantages of students in the learning process, and to di0agnose the advantages and disadvantages of teachers in the teaching process. Through diagnosis, assessment can improve students' learning behavior and improve teachers' teaching behavior. Therefore, it is not only to measure the development of students in the evaluation object, but also to assess the teacher's mastery of core literacy and the effectiveness of the core literacy training in teaching. We can only improve the understanding of the core literacy evaluation of high school mathematics teachers, and the level of understanding of the evaluation technology, especially to help teachers quickly improve the core literacy-based evaluation technology level. We can integrate the task of effectively improving the core literacy of students into the normal daily teaching of primary and secondary schools, and inject into the evaluation activities of daily curriculum teaching, so as to ensure that the core literacy-based evaluation is implemented.

4.3 Enrich evaluation methods and attach importance to process evaluation

China's evaluation method is based on the results of evaluation; the evaluation method is to use paper and pencil test and "one size fits all" score quantification. This kind of evaluation method can quickly identify students' mastery of knowledge and skills, but ignores many difficult evaluation aspects. Core literacy mainly refers to the core competitiveness of students and is an indispensable ability for students to adapt to future development. And the purpose of the assessment is to select the people who adapt to the social development for the society and promote the self-development and promotion of the students in core literacy. However, the current evaluation method only examines the mastery of students' knowledge, and does not comprehensively examine the development of students' core literacy, which makes teachers and students unable to get effective feedback from evaluation. Therefore, the evaluation cannot improve the students' learning behavior and the teacher's teaching

behavior. It cannot promote and detect cultivation of students' core literacy and cannot indicate the direction of the students' core literacy training.

Therefore, the high school mathematics assessment based on core literacy needs to correct the original knowledge-based results evaluation in the evaluation method, enrich the mathematical evaluation method, and evaluate the transformation from simplification to multidimensional and hierarchy. The evaluation method combines quantitative evaluation with qualitative evaluation, and is based on formative evaluation, so that many difficult to quantify aspects are evaluated in the process. In this way, high school mathematics assessment can examine the improvement of students' ability and thinking in the process of learning, and examine the mastery of students' core literacy. In addition, based on a single score, the selection and division of students in a rough way can not only measure the overall development of students, but also fail to implement the development of students in core literacy. Therefore, teachers should put evaluation in the process of student learning and life. They can use classroom observation, oral test, evaluation of performance in open activities, and internal and external homework evaluation to evaluate all aspects of students' core literacy. Through mufti-angle and procedural mathematical core literacy assessment, students' thinking truly undergoes the process of mathematics, expands the space of thinking, and consciously trains students to use mathematical concepts, principles, and methods to explain phenomena in the real world and solve problems in the real world. Thus, the evaluation promotes the application of students' awareness of application and innovation, and promotes the development of students' core literacy.

4.4 Increase open questions and present them with contextual issues

In the assessment, open questions should encourage students to think from different angles. The answer to an open test question should not be discerning right or wrong. As long as the student's thinking is clear and the logic is correct, the score can be scored. Such evaluation can not only improve the logical reasoning ability of students' core literacy, but also enhance students' sense of innovation and let students experience the fun of learning mathematics.

In addition, in the presentation of high school mathematics questions in our country, there are a large number of unconstrained questions, and students only do the exercises to do the questions. The test questions lack the situation and are far from the actual life. The students have not experienced the process of finding problems, asking questions and analyzing problems from life. They can't apply the questions to real life, which is not conducive to cultivating and examining the mathematical modeling ability of students' core literacy. This lack of constitutional test questions only improves the students' ability to solve problems. Lacking the foundation of problems found in the early stage, students can't model real-life problems as mathematical problems, making students' mathematical ability unattainable and unable to serve real life. This way of evaluating is also cultivated "The high scores and low energy "the root of the students. Cultivating students' core literacy is to prepare students for lifelong development. The merciless test questions obviously cannot promote students to apply mathematics in life and promote students' lifelong development. Therefore, the test questions should have a true situation in the presentation, reflecting the problem solving. Only true situations, especially the real situation close to the actual life of students, students have the interest and enthusiasm to think about problems, analyze and solve problems. It is also possible for us to find clues in the student's problem solution that reflect the core literacy of the students.

4.5 Use the results of the assessment to implement core literacy

After the evaluative results come out, the evaluation results should be used reasonably. According to the above suggestions, the evaluative results should effectively reflect the students' personality characteristics, the advantages and disadvantages in learning and the development of core literacy, and provide reference for improving the behavior and methods of teaching and learning. Therefore, in the evaluation results, teachers should pay more attention to the progress of students in the development of core literacy, pay attention to what students have mastered, what improvements have been obtained, and what capabilities are available. Thus, by enhancing students' confidence in learning mathematics and improving students' interest in learning mathematics, students can develop good study habits and promote the development of their core literacy. In addition, it is necessary to play the guiding function of evaluation. Through mathematics assessment, teachers can understand the potential of students, and what are the shortcomings in them, so that students can obtain targeted feedback and promote the development of students' core literacy.

5. Summary

In summary, this paper analyzes the connotation of core literacy, the characteristics of current high school mathematics assessment, and the requirements for high school mathematics evaluation in the "High School Mathematics Curriculum Standard". Therefore, from the aspects of evaluation indicators, content, objects, methods, presentation and functions, the author puts forward suggestions for evaluating students' core literacy of mathematics.

However, although the above analysis points out the important role of teachers in student assessment, it does not specifically analyze how to strengthen the role of teachers, and lacks improvement measures to strengthen the role of teachers. This is also a further improvement direction of this article.

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7. References

1. Wang H, Wu YM. Slow Down the Pace of Knowledge and Return to the Core Foundation. People's Education. 2015; (07):18-21.
2. Chen K. A Comparative Study of the Problem Characteristics of Mathematical Test Questions in the Perspective of Core Literacy- Taking the PISA

Evaluation Samples in 2012 and the Mathematics Test Questions in Beijing and Shanghai for the Past Five Years as an Example. Journal of Hubei University of Arts and Sciences. 2017; 38(05):79-84.
3. Kong FZ. The Cracking Countermeasures for the Core Literacy Evaluation of Chinese Students. The In-service Education and Training of School Teachers. 2017; (01):1-6.
4. Yu CM. Research on the Quality Evaluation of Mathematics Education Based on International Evaluation Projects. Zhejiang Normal University. 2017.
5. Hu FJ, Bao JG, Ren ZC, Chen A. Case Study on Core Literacy Evaluation of High School Mathematics. China Examinations. 2017; (11):10-16.
6. Chen LY, Liu XP. Exploration of Mathematical Propositions in Primary Schools with Core Literacy Based on PISA Mathematical Tests. The In-service Education and Training of School Teachers. 2017; (07):58-62.
7. Zhu YM, Liu W, Chen LS. A Large-scale Mathematical Proficiency Test Framework Based on Core Literacy. Educational Measurement and Evaluation. 2018; (09):18-24.
8. Weng YP. Research on High School Students' Mathematical Visual Imagination Literacy Evaluation. Fujian Normal University, 2017.
9. Hu DS, Lei PY, Liu T. Evaluation of Core Literacy of Mathematics: Based on the Perspective of PISA Evaluation Framework and Test Design. Education Measurement and Evaluation.
10. Zheng QL. Research on the Quality Evaluation of Primary School Mathematics from the Perspective of Core Literacy. JiMei University, 2018.
11. Zhang JZ. Research on the Connection of Mathematics Curriculum in Primary and Middle School Based on Students' Core Competence. Theory and Practice of Education. 2016; 36(22):56-60.
12. Xu BY, Cai JF. On the Evaluation of Mathematics Literacy and its Practice. Global Education. 2017; 46(9):13-24.
13. Chen LY, Liu XP. Exploring the Mathematical Propositions of Primary Schools with Core Literacy Based on the PISA Mathematical Tests. Education and Teaching Research. 2017; 31(8):66-70-78.
14. Sun XY. Investigation of Mathematics Literacy of Fifth-grade Primary School Students. East China Normal University, 2018.
15. Chen LY, Liu XP. Exploring the Mathematical Propositions of Primary Schools with Core Literacy. Fujian Education. 2017; (45):55-57.