

A Study on the Problems and Strategies of Evaluating the Academic Quality of Elementary School Mathematics

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Abstract: Actively carrying out mathematics academic quality evaluation is an inherent requirement to comply with the educational reform and development trend, and an important mission to cultivate the core competencies of mathematics and implement moral education, but the current academic quality evaluation has problems such as the restriction of the subject of evaluation, the solidification of the evaluation content and form, and the insufficiency of the subject's ability to evaluate the academic quality. Accordingly, strategies are proposed to emphasize the diversification and specialization of evaluation subjects, non outcome evaluation methods, and the comprehensiveness and diversification of evaluation dimensions.

Keywords: Core competencies; Academic quality; Academic Quality Evaluation

In March 2014, the Ministry of Education of China issued the “Opinions on Comprehensively Deepening Curriculum Reform and Implementing the Fundamental Task of Moral Education”, which clearly stated that “all levels and types of schools should start from the actual situation and student characteristics, and implement core competencies and academic quality requirements into the teaching of various subjects.”^[1] It can be said that actively carry out the evaluation of academic quality of mathematics is an inherent requirement of the development trend of education reform and development. The 2022 edition of the Mathematics Curriculum Standards for Compulsory Education has added the section “Evaluation Suggestions” in the section “Curriculum Implementation”, in addition to the addition of academic quality, which is divided into the connotation of academic quality and the description of academic quality^[2]. Academic quality is not only the requirements of the National Long-term Education Development Program, but also an important mission to cultivate the core competencies of mathematics and implement the mission of moral education, which is inevitably inseparable from the evaluation of academic quality in order to promote the deepening of the curriculum reform in the process of actual education and teaching.

1. Academic quality evaluation

The term “evaluation” is explained in the Dictionary of Education as “a judgment of the value of something.” Early scholars mainly used assessment to judge the degree of achievement of students’ learning outcomes, but nowadays people are more inclined to measure, analyze and judge the actual level of students’ comprehensive abilities. However, different scholars have different interpretations. One is that academic quality evaluation is a dynamic process, focusing on the process of judging the ability and development level of students. The second is to achieve a certain purpose, such as pointing to the overall development of students, and prompting students to achieve the purpose of value-added. The third is the task of the assessment of academic quality is a comprehensive process, multi-dimensional, multi-indicator system, multi-method comprehensive evaluation^[3]. Academic quality evaluation under core competencies covers the above three connotations, which is a comprehensive evaluation aiming at promoting students’ comprehensive development and focusing on students’ knowledge, abilities, attitudes, values and other aspects at different stages. It can help teachers, students and parents understand students’ learning outcomes, provide feedback and guidance for teaching, and also provide a basis for teaching reform and talent cultivation.

2. Current situation and problems of academic quality evaluation

2.1 The main body of academic quality evaluation is limited

In China’s traditional education evaluation system, it mainly relies on teachers’ evaluation of students’ academic performance and ability development. Due to the strong subjectivity, lack of one-sidedness and lack of effective feedback of the single evaluation subject, teachers

and parents begin to occupy a dominant position in the process of evaluation of academic quality, while the participation of students, social evaluation and other evaluation subjects is relatively low, especially ignoring the self-evaluation of students. They often find themselves in a passive position during this process, lacking the ability to self-evaluate and reflect, which is not conducive to the cultivation of students' awareness of self-directed learning. And there are differences in the evaluation standards of academic quality among schools, districts and even education administrative departments, which makes it difficult to make horizontal comparisons of the evaluation results, and these make the evaluation results subject to the influence of subjective factors and lack of objectivity and fairness.

2.2 The content and form of academic quality evaluation are solidified

The evaluation content tends to be knowledge-based. The "knowledge-oriented" evaluation content is actually the narrowing of the scope of academic quality evaluation. First, it narrows the dimension of student evaluation. Students' knowledge mastery is an important part of academic quality evaluation, but it is not the only part. The second is to narrow the focus of teachers' teaching, which leads teachers to pay more attention to the imparting of knowledge in the process of teaching design and implementation, and neglects the cultivation of students' mathematical thinking ability, reasoning consciousness and innovative consciousness. The form of evaluation habitually takes the final evaluation as the main one. The final evaluation is carried out after the end of the semester or project, which can help students and teachers quickly understand the achievement of learning results and teaching goals, and improve the evaluation efficiency to a certain extent. However, it may lead to the delayed feedback of teachers and students on learning problems, which is not conducive to timely adjustment of teaching methods and strategies, and is not conducive to comprehensive assessment of students' abilities. It will also cause students and parents to pursue scores too much, which will increase students' pressure in the learning process, resulting in anxiety and affect their physical and mental health.

2.3 The evaluation subject's ability to evaluate academic quality is insufficient

First, the evaluation subject has insufficient knowledge of academic quality evaluation. The evaluation concepts of some evaluation subjects are lagging behind, still remaining in the traditional concept of exam-oriented education, paying too much attention to students' scores and rankings, and neglecting the evaluation of students' learning process, ability cultivation and comprehensive quality. Secondly, the acceptance of new evaluation methods by evaluation subjects is low. With the continuous development of educational concepts, new evaluation methods such as formative evaluation, process evaluation and value-added evaluation have gradually been emphasized, but some teachers may not have a high degree of acceptance of these methods. Third, the evaluation subject lacks experience in non-resulting evaluation. In the process of non-outcome evaluation, there may be some subjective assumptions. Without formulating reasonable evaluation standards or not strictly implementing the evaluation according to the standards, it is easy to frustrate students' enthusiasm and lead to students' low attention to the evaluation results. Teachers may only use a single evaluation method in non-results-based evaluation, such as relying on verbal praise or criticism only, and failing to make full use of a variety of evaluation tools such as observation, interviews, students' self-evaluation, etc., thus failing to get a full picture of students' performance.

3. Academic quality evaluation strategies

3.1 Attention to the diversification and specialization of evaluation subjects

The main body of elementary school mathematics academic quality evaluation should include teachers, students and parents. Teachers can evaluate students' academic achievement and performance according to the objectives and requirements of mathematics teaching, focusing on the cultivation of students' core competencies skills. Parents can learn about their children's academic performance and evaluate their children by paying attention to their children's learning progress and communicating with their teachers. Students can evaluate their own academic quality through self-reflection, setting learning goals. They also can academic mutual evaluation by having students engage in group discussions in the math classroom, work on projects in the integrated and practice areas, and grade each other on a particular task mathematics. In order to ensure the specialization of the evaluation subjects, experts and teachers from different backgrounds and fields can be invited to participate in training the evaluation subjects to improve their professional knowledge and evaluation skills, for example, training in evalu-

ation methods, the use of evaluation tools and data analysis.

3.2 Emphasizing non-results-based evaluation methods

Academic quality assessment has gradually changed from single paper-and-pencil test assessment to non-results-based assessment. First, establish the concept of non-results-based evaluation. Schools, teachers and parents should jointly recognize the importance of non-results-based evaluation, pay attention to the overall development of students, and cultivate students' subjectivity, innovative spirit and practical ability. Secondly, non-resultative evaluation standards should be formulated. Comprehensive and scientific evaluation standards should be formulated according to the national curriculum standards and students' developmental needs, covering the aspects of morality, intelligence, physical fitness, aesthetics and labor, and focusing on students' process performance. Finally, a feedback mechanism for non-results-based evaluation results should be established to provide students, parents and teachers with timely evaluation information to guide educational and teaching improvements.

3.3 Emphasizing the comprehensiveness and diversification of evaluation dimensions

The ultimate goal of mathematics academic quality evaluation is to cultivate the core competencies, while also focusing on the quality of the process and the quality of the results achieved by students after completing a certain stage of curriculum learning. The first is the evaluation of the acquisition of mathematical knowledge and methods of thinking, focusing on the formation and development of students' basic mathematical knowledge, basic skills, basic thinking and basic activities. The second is the evaluation of the application of mathematical thinking, starting from students' familiar life and social situations, and cultivating students' ability to observe the real world with mathematical vision, to think about the real world with mathematical thinking, and to express the real world with mathematical language. The third is the evaluation of the emotional attitude towards mathematics, in which students experience the accumulation of experience in learning and applying mathematics, practical exploration activities, and cultivate the ability to discover problems, raise questions, analyze problems and solve problems, so as to develop the learning habits of independent thinking, inquiry and questioning, cooperation and communication, and to initially form a sense of self-reflection.

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