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A Practical Study on Value-Added Assessment in Primary English Education

Jierong Qin, Fan Zhang*

English Teaching and Foreign Language Assessment, Sichuan Normal University, Chengdu 610000, Sichuan Province, China

***Corresponding author:** Fan Zhang, 648124213@qq.com

Abstract: As a programmatic document to guide the reform of educational assessment, the "General Plan for Deepening the Reform of Educational Assessment in the New Era" clearly points out the requirement for exploring value-added assessment [1]. In the process of exploring, Tennessee Value-Added Assessment System (TVAAS), which was implemented in Tennessee, United States in 1992, has a certain referential significance to the practice of assessment reform in primary English education [2]. This study aims to build a value-added assessment model in line with China's learning conditions by using big data and carry out pilot experiments in order to promote the development of educational assessment in primary schools.

Keywords: Value-added assessment; Primary English education; Practical study

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1. Background of value-added assessment

Value-added assessment is an evaluation measure formed under the school accountability mechanism [3]. Value-added assessment originated from Coleman's Report in 1966, which did not directly put forward the issue of school efficiency, but its research conclusion triggered the worldwide debate on educational equity, which led to the emergence of value-added assessment. In 1983, the American Council for Quality published a report, "The Nation is in Danger: The Imperative of Educational Reform," which triggered a boom of school value-added assessment methods among scholars [4]. In contrast to the No Child Left Behind (NCLB) Act of 2001, which insisted that all students meet certain standards, the "Every Student Succeeds Act" (ESSA) signed by Obama in 2015 attaches more importance to the growth and progress of individual students and seeks a balance between encouraging underachievers and protecting excellent students [5]. Rather than focusing on the absolute score of a single examination, the assessment emphasizes on the relative improvement of students. Good School, a non-profit third-party evaluation agency in the United States, also launched the "comprehensive assessment" in 2017. The basic idea is that value-added students are more accurate indicators to measure a school and should provide parents with information about the quality and advantages of the school as well as reflect what parents think is meaningful [6].

Relevant policy evaluations suggest that accountability under value-added assessment is conducive to the improvement of students' overall achievement. Since No Child Left Behind, the percentage of North Carolina students in grades 3 through 8 who scored above grade level in reading rose from 63% in 1992/93 to 77% in 2000/2001, according to state data, while their math scores rose from 61% to 81%.

In 1992, the concept of value-added assessment entered the United Kingdom (UK), and British scholars carried out extensive research on it. In 2002, the British government conducted a pilot experiment [7]; in

2006, the value-added assessment model was introduced across the UK. The value-added assessment system in the UK mainly focuses on the school level. The design of the model mainly considers school factors that affect the quality of school education [8], and at the same time, how to carry out value-added assessment in a multi-level structure, represented by school, grade, class, individual, and other levels.

2. Connotation of value-added assessment

In order to understand the concept of value-added assessment, think of it as a growth curve [9]. Parents stand their child up against a wall and mark their child's height at age 2, 3, 4, and so on, with a pencil on the wall. From this data, parents can draw a graph to depict their child's growth in height. Often, parents find that their child's growth curve is not as smooth as that of the pediatrician. Instead, there are "depressions" and "bumps." A child may grow quickly and unexpectedly. In the same way, this process is reflected in education. Suppose schools test students' math knowledge every year, and the scores obtained from those tests are used to draw a curve for each student's math score progression. Each student's progression curve will appear "dented" and "bulging," similar to a child's growth curve [10].

Value-added assessment is one of the most advanced educational assessment methods worldwide [11]. In essence, it highlights the concept of quality education, and at the same time, it acts as a kind of developmental evaluation. Compared with summative assessment, the focus is not on the final score, but rather based on each student's level to establish a frame of reference as the starting point, a specific stage in the dynamic changes of middle school students to judge in accordance with the changes, as well as the factors that influence the process and change. This kind of educational assessment method makes up for the disadvantage of the "only score theory," which largely focuses on grades and class rankings, and shifts the attention to the stability of the changes in the value-added range. The progress of students is the value of their own growth. This assessment method not only helps students build confidence, but also enables parents, schools, and students themselves to focus not only on their scores, but also the reasons for the changes behind them, which is far more meaningful than the final evaluation [12].

3. The premise of value-added assessment

3.1. "Let evaluation become a form of promotion" and give full play to the incentive function of evaluation

Value-added assessment was originally proposed to define responsibility and determine the success of school education [13]. The purpose of assessments is to gauge the situation of students in a comprehensive manner. Students in primary schools are in the critical period of physical and mental development, and the evaluation by teachers plays an important role. Considering the personality and psychological characteristics of students, targeted evaluation is then carried out.

3.2. Carry out value-added assessment in stages beginning from students' foundation

Primary schools are the foundation for students to learn English [14]. Although all students learn English, their talents and efforts differ, which may cause hierarchical differences among students over time. By evaluating the different starting points and original language of students, the evaluation may be more accurate. In order for weak students to focus for a longer period of time, progress and achievements should be emphasized to build their confidence; for ordinary students, in the context of fluctuating results, it is important to analyze the reasons, identify the causes, and guide them in self-adjustment; for excellent students, teachers should safeguard their passion for learning and help them improve their overall English learning ability [15].

3.3. Establish a scientific view of educational assessment, and promote the integration of science and technology into basic education assessment

In recent years, with the advent of the era of big data and 5G, the integration of information technology into education has gradually deepened. Educational assessment is complex and diverse, and at the present stage, it is a blend of multiple subjects and technologies, including education, statistics, and computer science. With the constant development and progress of modern science and technology, in addition to the unceasing enhancement of education level, the all-round development of students is the ultimate goal of education, in which paper examinations cannot accurately measure all dimensions. Under the framework of intelligent evaluation, the combined qualitative and quantitative evaluation method is adopted in educational assessment [16], and the subjects are more diversified. Parents, teachers, schools, and students can jointly carry out evaluation. In the era of big data, it is of great significance to explore diversified, intelligent, and comprehensive evaluation methods for the development of basic education and individual student development.

4. Value-added assessment models

Among the commonly used value-added assessment models, the student growth percentile (SGP) is widely used in the United States in view of its strong applicability, which is worthy of attention and reference in China's educational circle. The SGP was proposed by Betebenner [17]. Its core idea is to divide students with similar academic levels into groups and compare individual progress within those groups. As seen in **Table 1**, student A scored 64 on the first test and 71 on the second test, with an improvement of 7 points, moving from 25 to 34 in the school's percentile; student B, on the other hand, scored 89 on the first test and improved by three points on the second test, moving from the 90th to 92nd percentile. Student B scored higher than student A by absolute comparison, but in terms of absolute growth, it is clear that student A showed more improvement than student B. These conclusions are not fair because student B has a high starting point with little room for progress, while student A has a larger room for progress. In this case, it is unreasonable to compare only by looking at the absolute value of the increase in scores between the two students. It is reasonable to compare the increase in scores if the two students are placed in the same group. The student growth percentile is more suitable for comparison among groups with large gaps in academic performance under a large sample size [18].

Table 1. Progressive scores of student A and student B

Student	Test score X	Test score Y	Increased score X-Y	Progressive score 100-Y
A	71	64	7	36
B	92	89	3	11

However, with the same educational resources, it is not meaningful to consider the percentage grade of students in the same class, and in primary schools, there is no obvious gap between students [19], so a class can be divided as a whole by default. If the full score of the English test paper is 100, assuming that the score of student A in this test is X and the last standardized test score to be compared is Y, then the score that student A can improve in this test is 100-Y; the value can be obtained by using the formula (X-Y)/(100-Y) (as shown in **Table 1**). Due to the "ceiling effect" and "floor effect," the influence of the improved score of students of high academic levels relative to that of students of low academic levels is difficult to compare [20]. When considering the fairness of value-added, only looking at the growth of scores of students of different academic levels is not fair; in fact, this does not mean that student A's academic level is better than that of student B. According to calculation, student B's progress is greater than that of

student A within the increment value.

$$A: (X-Y)/(100-Y) = 11/40 = 0.175$$
$$B: (X-Y)/(100-Y) = 3/11 = 0.273$$

This method of calculation is easier for frontline teachers to understand, and it has a reference significance to a certain extent.

5. Implementation of value-added assessment

Students are evaluated from three dimensions; namely, learning ability, academic performance, and thinking quality.

The cultivation of students' learning ability mainly lies in the cultivation of students' autonomous learning ability, cooperative learning ability, reflective ability, and critical thinking ability. Good study habits are the premise of good learning ability. In order to nurture students' autonomous learning ability, teachers can plan based on the learning record form, filled up by students themselves, parents, and teachers. In this process, students will be given one day for reflection and summary. During their self-assessment, evaluation and encouragement from others will further stimulate their interest in learning.

In terms of students' academic performance, teachers should follow the guidance of the key concept of SGP and fully consider the practical situation. Dividing students with similar academic levels into groups and comparing individual progress within the group will be beneficial. In order to avoid ranking students solely by their scores, their scores should be recorded dynamically and continuously in their personal files. At the same time, their learning progress at all stages should be recorded accurately and meticulously. In daily learning, teachers should combine summative evaluation with process evaluation as well as peer evaluation with self-evaluation, so as to promote teaching and learning with evaluation. In light of the results of multiple evaluations, their academic performance can be evaluated holistically. The value-added academic performance should not be limited to scores because scores are just numbers, and within the value-added assessment system, numbers are merely used for reference. Teachers should quantify the academic performance of students at every stage and then use qualitative analysis to determine whether the students have achieved ideal performance.

As for the cultivation of students' thinking quality, with the help of information technology, the test questions extracted from the corpus can be modified based on students' academic level. If the academic performance of most students in the class is in a state of continuous growth, the teacher can increase the level of difficulty to create space for students' development. However, if the increment of students is not apparent, or there is negative increment among some students, the teacher should reduce the level of difficulty of the test questions, so as to ascertain students' confidence. At the same time, teachers should also analyze students' academic records and consider other factors besides the difficulty of academic tests, such as issues in communication with family members and peers.

6. Limitations

The value-added assessment model is widely used in various countries, of which the Tennessee Valued-Added Assessment System (TVAAS) is well-recognized in the United States [21]. Although the algorithm is mature and contains multiple types of data, and professional computer programs can scientifically predict the value-added space of students, the algorithm is complex, and the data demand is huge. As a result, both, teachers and parents find it difficult to understand the algorithm in the stage of primary education. Although the value-added assessment model proposed above is easy and simple to understand and operate, its data accuracy is weak. Therefore, the investigation of value-added assessment necessitates the joint efforts of

all walks of life as well as continuous theoretical exploration and practical research.

Disclosure statement

The author declares no conflict of interest.

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