

# The Double Effects of Standardized Testing on Students and Environment

Yiying Lai<sup>1, \*</sup>

<sup>1</sup>Department of Curriculum and Instruction, University of Minnesota, Twin Cities, Minnesota, 55414, The United States

\*Corresponding author: lai00091@umn.edu

**Abstract.** With the widespread use of standardized tests today, much of the understanding and research on standardized tests is based on specific effects and aspects. This paper discussed how standardized testing affects students as well as the surrounding community, including teachers and schools. By integrating the findings and analyses of previous studies, this paper argues that the effects of standardized tests are two-sided. There are serious negative effects caused by the standardized tests, such as test anxiety, teaching to the test, achievement gap, but it has positive effects on student learning too, such as making self-assessment, improve self-efficacy, and reducing forgetting. The reason to write this paper is because it will give decision-makers, researchers, and educators a better understanding of standardized tests and will aid them in using them more effectively. Previous studies had limitation in considering the complexity of participants and lacked new data in certain area. Future research could consider how to balance the benefits and negative effects of standardized tests in real-world teaching and learning settings, and better use standardized tests while pursuing educational equity.

**Keywords:** Standardized testing; Effects on Teachers and Students; Uses and Limitations.

## 1. Introduction

As a measurement tool, standardized testing has a long history [1]. These days, it serves many different roles in a wide range of nations and regions. The use of standardized exams to measure students' academic progress in classrooms is now the most well-known of these goals [2].

Standardized testing is a topic that has been the subject of much and varied discussion. Past research and discussion focused more on the effects and practical applications of a particular aspect of standardized tests. But general descriptions of the effects associated with standardized tests are still relatively lacking. That is the primary goal of this paper.

This paper's purpose is to combine prior studies and conduct a thorough analysis and evaluation of the effects of standardized testing. The first section will introduce the meaning and history of standardized tests. The second section will describe the effectiveness of standardized tests, including the impacts on students and the environment with the effects on teachers and school.

## 2. Overview of Standardized Testing

### 2.1 Meaning of Standardized Testing

Any test that is given and graded according to a predefined and standard procedure is considered to be standardized [3]. Standardized testing is used under the assumption that it is able to measure students accurately and objectively [2]. After using standardized testing, students, educators, and parents are able to receive the scores or grades of the tests. This number or alphabet easily and specifically expresses the achievement students made. The higher, the better that student achieves. The objective, direct, and accurate are main features of standardized testing.

### 2.2 History of Standardized Testing

Standardized testing has a long history that can go back several centuries. In China, the most traditional standardized testing is the imperial examination which is controversial at the start time.

Imperial examination was the system of using tests to select civil service for more than 1200 years [4].

Choosing professionals to meet the demands of the army and military production became a priority during the First World War (1914–1918) [1]. After the success of army recruit testing, civilian testing is advocated. In 21st century, whether in China or the United States, standardized tests are used in a variety of ranges, including college admission, recruitment, professional licensure, and many more.

### **3. The Effectiveness of Standardized Testing**

#### **3.1 The Influence on Students**

As a common measurement tool in educational settings, standardized testing influences students including academic development, academic achievement, and mental health.

##### **3.1.1 Academic development**

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Tests are capable of reducing forgetting. Carpenter et al. [5] found that restudying did not enhance overall recall as much as testing did through three experiments. Experiment 1 and 2 investigated learning of obscure facts of participants (55 participants, 42 females and 13 males in Experiment 1; 57 participants, 47 females and 10 females in Experiment 2) through two difference procedures including a feedback-based test (test/study) or an added opportunity of learning(study), in which 60 obscure facts are presented as statements on a computer screen for 6 seconds. Participants were finally required to take a final test of 10 facts that did not provide feedback. Participants in experiment 1 completed one test/study or one study. In experiment 2, participants performed three tests/studies or three studies. Experiment 3, however, investigates learning of Swahili-English words under the same two situations, test/study or study. Experiment 3 had 44 participants, 35 females and 9 males, drawn from Experiments 1 and 2. Most of the participants in the three experiments had an average age of no more than 30, with an age range of 18 to 63. Participants performed three tests or three study opportunities in experiment 3. In the results, having three opportunities to test/study significantly reduced the forgetting rate. In practice, students need to review their knowledge and retrieve information from long-term memory, and the tests require practice and repetition, which is important and useful for strengthening memory.

Students can make self-assessment from testing. Through the process of self-evaluation, students assess their learning, paying close attention to their accomplishments and their learning's outcomes [6]. What it can help for students is that it enables them to evaluate their own learning and reflect on their own learning. Through literatures study and integration of prior studies and conclusions, Dochy, Segers and Sluijismans [7] discovered that, in the majority of circumstances, self-assessment may be utilized to help the learning of skills and abilities, and that this self-assessment in educational settings improves performance in the classroom. When students take tests, they can learn which techniques are effective and which are ineffective. There are various methods in learning, like drawing mind maps, highlighting in textbooks, self-explanation, and more. But not everyone is suited to one method. So, tests are able to provide a chance for students to examine whether their learning techniques are suitable for them or not. Tests can be used by students to evaluate themselves and change their study strategy. Students can determine what they are good at after taking examinations. For instance, some students might benefit from creating a mind map, whilst others are better at explaining things to themselves. The advantage of using standardized testing as a method for self-evaluation is that it has a clear standard, has feedback from teachers. So, students can make self-assessments based on their standardized tests.

Self-efficacy is the person who believes he or she is capable of carrying out the actions required to result in a particular performance [8]. Students can gain and improve their self-efficacy with the aid of tests. Self-efficacy heavily affects achieving objectives, finishing tasks, and overcoming

obstacles. People with strong self-efficacy may recover rapidly from failures, believe they can attain success after a few trials, and have the confidence in learning new things. In contrast, those with low self-efficacy are more prone to quit up, doubt their abilities, and be afraid of the unknown. For students, low self-efficacy creates a vicious circle. Students who have low self-efficacy may quit trying very soon and when they receive the test scores that verify their illusion that they are incapable, they will strengthen this illusion and lower their self-efficacy more. The good thing is that self-efficacy is flexible and can be developed through exercise. Testing interventions in this situation is one technique to raise students' self-efficacy [9]. Standardized testing with feedback can improve students' self-efficacy by making them believe in their ability to take the test and that the test is going well by many tries and feedback from their teachers. Therefore, in the face of important exams, such as the Chinese college entrance exam, there are repeating practice exams to allow students to master the tests taking experience and increase their self-efficacy.

### **3.1.2 Academic achievement**

When educators and university admissions officers are using standardized testing as a measurement tool, they want to have a glance about students' academic performance. Hence, they can use test scores to determine a student's academic achievement and whether this student can continue higher education. However, the scores of standardized tests are related to socioeconomic status [10]. From Camara and Schmidt [11], minorities have been harmed by discrimination, poverty, and poor academic preparation. They learned from the data that students with more educated parents perform better on the Scholastic Assessment Test (SAT). Compared to white and Asian American parents, parents of African American and Hispanic children have substantially lower levels of education. Also, parental income had a considerable impact on students' SAT results as well. The SAT results of students whose parents' income was less than 20,000 dollars had much lower verbal and math scores than the national average. In this case, minority students who are affected by other factors have less effort and time in their class. They receive less resources and assistance than other classmates who are not affected or are less affected. Therefore, their academic performance will be less competitive than their classmates who are not affected by other factors. The use of standardized tests like the SAT will significantly impact students' chances of attending higher education and their generation's future. Under these circumstances, it is prejudiced and unfair to use standardized testing as the sole indicator of academic achievement.

### **3.1.3 Mental health**

Anxiety is considered when worry is excessive or disproportionate to the potential threat, involving anticipation of future threats [12]. Experiment made by Fulton [13] provides an indirect support of the negative physiological responses that testing can have for students. In her experiment, participants were a total of 50 white students from middle-class families in grade 4 at a suburban public elementary school in Long Island, New York. The first data was collected through the revised Test Anxiety Scale (TAS). The second collection was the students' pulse rate, which is the number of heart beats per minute. The baseline pulse rate was determined one week before the test's administration. Additionally, each student's level of anxiety will be determined by comparing their baseline pulse rate to their pre-test pulse rate. Correlations will be calculated based on the collection of questionnaires, pulse rates, and student test scores. In the end, Fulton [13] discovered that although there was no significant association between test scores and students' TAS, there was a substantial negative correlation between test scores and pulse rate. Students' performance will be impacted by how stressed they are throughout exams. And if tests are related to academic achievement, students may worry about their scores and exaggerate the failure they imagine. At the end, students probably have test anxiety. Salend [14] focused that students with test anxiety experience extreme stress, tension and apprehension during exams. It is a vicious circle for students. Students with test anxiety show a variety of warning signs in their physical, behavioral, and affective [14]. For example, they may shake, try to cheat, or degrade themselves. Once the test results are consistent with students'

negative expectations, they will be more anxious when the next test comes. Test anxiety hinders students' academic performance and even worse their mental health.

### **3.2 The Effectiveness for Environment**

#### **3.2.1 Teachers' teaching**

Teachers will be influenced by the emphasis on testing. When the role of tests is important, the pressure from teachers increases because they have the responsibility to improve students' test scores [15]. The result is tests make teaching to test [16]. Teaching to the test entails utilizing all available resources and classroom time to get students ready for standardized tests [17]. Teaching to the test reduces the portion of teaching in the discipline. More time is spent in class on exercises, drills, and other rote memorization activities. Furthermore, the emphasis on basic skills courses during exam time sometimes comes at the price of higher thinking abilities. One example is provided by the case of teaching practice. The second book of mathematics for the ninth grade, published by People's Education Publishing House, has four chapters. The Quadratic Function, which will be the focus of the exam, receives more time in class so that students can practice and work on it, while the Projection and View, which are also covered in this book, receive less time because they are not a significant component of the exam. However, the Projection and View chapter makes a strong connection between reality and students' everyday lives. Relevant educational researchers need to be informed about this. Also, teaching to the test reduces the time that non-test participants use. For example, art and music classes are not included in the standardized testing which means these two classes may be declined in the schedule of students. In recent years, this phenomenon has become better. The focus of non-test participants is growing. To best ensure the scores, in addition to teaching to the test, teachers may focus more on students who are completely successful in test scores. Students with high potential in tests can get more attention and help from their teachers, while students who really need more help may lose the assistance from their teachers.

#### **3.2.2 School environments**

The environment of the classroom will be impacted by an excessive test-focus. When schools only care about students' scores, they sacrifice the culture and development of students [18]. Test scores are the only language and indicator for educational policy makers to decide and change their policy making. Other things like the interaction between students in class, knowledge and experiences at the edge of official courses, and the relationship between children, family, and teachers are dismissed. Those cannot be quantified are hidden and forgotten under the test scores. But can school leaders and policy makers really depend on those numbers? Test is not a purely measurement tool to show students' academic performance and achievement. "Standardized tests were created to differentiate by race and class" [2]. "Objective" test scores give white parents a reliable reason to choose the school which is whiter and richer for their children; at the same time, they downgrade the color of people to inferior track with fewer resources like high-qualified teachers [19]. Schools must push students to practice their memories endlessly in order to improve academic performance and meet goals. In schools where people of color make up a large majority, this phenomenon is more obvious. While this is happening, more humane and beneficial art and music education can be found at the better schools with white students. More well-rounded white students will be at a bigger advantage when applying to colleges.

### **4. Limitations and Future Direction**

There are still some limitations on the earlier study. First, the participants were just briefly considered. The experiment's outcomes may be influenced by the participants' age, gender, socioeconomic class, and race. For instance, Carpenter et al. [5] experiment participants tended to be female and ranged greatly in age. The effects of gender and age were not specifically considered in this investigation. Another example is that the findings of the study by Camara and Schmidt [11] did

not reflect Asian Americans' reality. Additional investigation and discussion are needed for this specific scenario. Each of these various factors could have an impact on the study's findings and, consequently, on the researchers' and educators' conclusions. Second, several components of the data and research are noticeably lacking in the more recent studies. For instance, in the domains of academic success and self-assessment. The opinions of those involved in education may also be influenced by outdated data and findings. This is especially true when it comes to the previously mentioned intricate subject profiles. Future research could extend the study of missing areas, such as self-assessment, and more targeted experimental procedures.

## 5. Summary

This paper examines the impact of standardized tests, including how they affect students and learning environments. Standardized tests have a double meaningful influence, according to a review and summary of past research. There may be certain serious disadvantages to standard tests. Standardized tests can lead to test anxiety and serious psychological stress for students. Also, academic achievement decided by standardized tests are affected by many factors, which can result in educational inequality. When educators and educational institutions put too much emphasis on standardized tests, the value of humanistic education is overlooked, and inequalities are increased further. Ultimately, educational inequality can trigger achievement gaps between students. But it has also been demonstrated that standardized testing provides academic advantages. It can help reduce students' forgetfulness, increase their sense of self-efficacy, and do learning self-assessment. Standardized testing has a special importance as a teaching tool and can indeed improve students' learning. The meaning of this paper is to provide educators and policy makers with a more comprehensive understanding of standardized testing. Previous studies have limitations in the consideration of participants, such as ignoring the role of age, gender, and cultural background of the participants in the experiments. As well as the lack of investigation into the mechanisms behind the influence of standardized tests. Based on this situation, future research could adopt a more targeted experimental procedure to reduce this aspect of influence. Another limitation is the lack of updated research data and discussion in certain areas, such as self-assessment. Future research could expand on these areas.

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