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RESEARCH IN FOCUS:

Test Prep Strategies That Work

INTRODUCTION

In the era of mandatory state testing, testing standards have raised the stakes for students, parents, and educators. With these high-stakes tests, students, educators, parents, and researchers are rushing to implement any and all available strategies that might give students the slightest advantage. Given the importance of these tests, reviewing the available literature on standardized testing preparation is critical in determining the efficacy of common strategies utilized to help students prepare. Particularly, educators will benefit from an understanding of how traditional test preparation strategies fall short and what strategies are supported by current research. Additionally, understanding the links between social-psychological factors, such as stereotype threat and student achievement, in high-stakes testing may further aid educators and students in the era of mandatory testing.

TRADITIONAL TEST PREPARATION STRATEGIES

A variety of activities exist within the purview of high-stakes test preparation. Test preparation might include developing strategies to determine best answer choice, learning the testing format, helping students improve their writing skills, taking practice tests, assigning tasks that allow students to integrate various learned concepts, giving in-class tests designed to test higher-level understanding, and much more. Unfortunately, many educators often become focused on implementing strategies that develop students' test-taking skills instead of developing students' knowledge and understanding of the test materials. A 2009 report published by the National Association for College Admission Counseling indicated that the most common methods of test preparation fall into three categories: "content review, item practice, and orientation to the format of the test" (Briggs, 2009, p. 11). This form of test preparation is widely used and commonly thought to be the most effective use of course time. In reality, spending time on practice tests and developing test-taking strategies has been shown to range from having a minute effect on mandated test scores to having no effect (Briggs, 2001; Briggs, 2009; Powers & Rock, 1999). These effects seem to hold true, regardless of whether students are learning independently, in high school classrooms, or in private courses specifically designed to improve test scores.

There are several reasons why typical test preparation strategies have little to no effect on student testing outcomes. Researchers suggest that focusing on this type of instruction may lead to misconceptions about test content and unrealistic understanding of the testing difficulty (Allensworth, Correa, & Ponisciak, 2008) among students. Perhaps the most poignant example comes from practice test instruction. One study conducted by ACT researchers found that taking practice tests increased ACT scores by an average of .4 points (Scholes & Lain, 1997). However, for practice tests to be effective, they must be realistic in both difficulty level and length of test-taking time. Unfortunately, in an effort to help students better understand question items, teachers are likely to break practice tests up into several batches of questions and spend large segments of time on each item (Allensworth et al., 2008). While this method may help students develop test-taking strategies relevant to the presented questions, these same strategies might be ineffective under realistic (timed) testing conditions.

DIFFERENCE IN AVERAGE ACT SCORES BETWEEN CLASSROOMS THAT DID THE ACTIVITY ONCE A MONTH OR MORE, COMPARED TO CLASSROOMS THAT DID THE ACTIVITY LESS THAN ONCE A MONTH:

IN ENGLISH CLASS:

- Discussed how culture, time, or place affects an author's writing
- Explained how writers use tools like symbolism and metaphor to communicate meaning
- Improved a piece of writing as a class or with partners

IN MATH CLASS:

- Discussed possible solutions to problems with other students
- Used a graphing calculator to complete an assignment

IN SCIENCE CLASS:

- Used evidence/data to support an argument or hypothesis
- Found information from graphs and tables

ACROSS ALL CLASSES:

- Wrote papers defending their point of view of ideas five or more times

From *High School to the Future: ACT Preparation–Too Much, Too Late*

TURNING TO WHAT WORKS

Given that traditional test preparation strategies may fall short, understanding the emerging test strategies that work is important to begin better preparing students for standardized testing.

> *"Test prep should be much more than time spent focusing on practice tests and developing test taking strategies; test prep should involve integrative training in course curriculum, development of engaging instruction leading to boosts in student participation, and deconstructing student misconceptions concerning the ACT."*

In a study conducted by the University of Chicago, researchers found the following activities to significantly improve testing scores when used on a regular basis. In English, these activities include an extended focus on grammar rules, writing five or more papers defending a point of view, and improving a piece of writing as a class or with partners. In math, the use of graphic calculators to complete assignments and student discussion of possible solutions to problems can help to improve test scores. In science, students who completed multiple activities requiring them to select and defend their own hypotheses scored significantly higher on the ACT (Allensworth et al., 2008).

Another helpful strategy might involve encouraging teachers to talk with students about the relevance of each lesson to the ACT. For example, teachers could explain the importance of understanding how to edit a paper or combine various mathematical concepts together to solve a complex problem and how these lessons are related to ACT testing. This strategy could help students begin to eliminate some of their unrealistic expectations of ACT requirements.

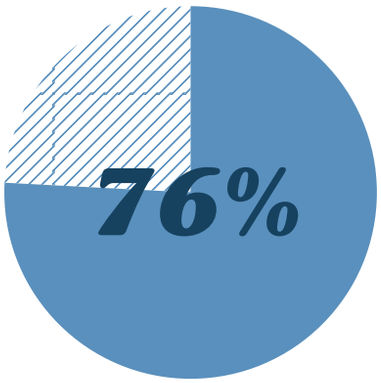
A CASE STUDY

Beyond particular activities and test-prep strategies, research shows that inquiry-based learning seems to continue to be effective in raising student knowledge, attitude, achievement, and high stakes testing scores — especially in STEM classrooms (Schneider, Krajcik, Marx, & Soloway, 2002; Turner & Rios, 2008). Inquiry-based learning refers to an educational process that helps students move beyond memorization and toward connecting classroom knowledge to their worlds. Interviews of high school students reveal that students often view the ACT as a test of material separate and distinct from what they learn in class (Allensworth et al., 2008). Inquiry-based learning is effective in countering this belief, as it allows students to integrate core subject material into daily life.

A recent study found that test scores show significant improvement when students are able to integrate core curriculum ideas into their everyday lives (Kalchman, 2011). In the study by Kalchman (2011), students were required to write about a personal experience outside of school that required them to use mathematics. To complete the assignment successfully, students had to describe the situation and explain the mathematical approach and processes they used to help solve the problem. Not only were students required to complete the mathematical equations the problem required them to solve, but they were also required to explain the conceptualization of the mathematics being performed (as opposed to explaining the procedure). This assignment occurred every week over the course of a school year. Each week, the teacher would set aside time for students to share their accomplishments. The students were interviewed several times over the course of the year. The majority of students reported that the weekly assignments helped them feel well-prepared for the unpredictable nature of standardized test questions. The students further indicated that the math–in-everyday-life assignments helped to boost both their competence and their confidence in answering extended-response questions. One student stated that the assignments were important because "it is making us better at math because we take what we learn in the classroom and apply it to everyday life" (Kalchman, 2011, p.26). These assignments also allow students to connect on an individual and personal level with the curriculum, something which has been found to be necessary for effective learning (Dewey, 1902; National Middle School Association, 2010). In this study by Kalchman (2011), researchers discovered that 76% of students significantly improved their standardized testing scores from fall to spring, and 71% of students showed significant improvement in the clarity of their explanations on their weekly assignments.

Although the Kalchman (2011) study was conducted with fifth-grade students, it could easily translate to middle school and high school. The author suggests that teachers plan similar assignments around their state and local processes and content standards and use the assignments as a guide to understand individual students' comprehension level (Kalchman, 2011). It seems that this type of integrative assignment might allow educators to move beyond "teaching to the test." Kalchman (2011) suggests that these life-experience-based assignments allow teachers to maintain the integrity of the standards-based curriculum while also preparing students emotionally and academically for standardized testing.

CONSIDERING STEREOTYPE THREAT: A FINAL STRATEGY



76% OF STUDENTS PRACTICING WEEKLY LIFE EXPERIENCE ASSIGNMENTS SHOWED SIGNIFICANT IMPROVEMENT IN TEST SCORES.

In addition to more academic style preparations, other important factors continue to influence students' standardized testing results. The literature continually reveals disparities between Caucasian and racial/ethnic minority student achievement as well as gender differences in math and science test scores. Although the general student population has shown significant achievement gains in the last 20 years, African American and Hispanic students consistently score lower on standardized tests and lag behind in high school GPA (College Board, 2013; National Assessment of Educational Progress, 2012; National Center for Education Statistics, 2011). Similarly, female students continue to underperform in math and science standardized testing when compared to their male counterparts (The College Board, 2013). Several programs have been developed in the last decade to help combat the disparity in the aforementioned achievement scores, but these programs and strategies have been largely unsuccessful (Good, Aronson, & Inzlicht, 2009).

Stereotype threat refers to

> *the social-psychological threat that arises when one is in a situation or doing something for which a negative stereotype about one's group applies. This predicament*

threatens one with being negatively stereotyped, with being judged or treated stereotypically, or with the prospect of conforming to the stereotype. (Steele, 1997, p. 614)

Stereotype threat can affect any group but is likely to have the most impact when a person identifies with a group that is subject to pervasive negative stereotyping. For example, African American and Hispanic students are forced to confront societal stereotypes suggesting that they should not perform well in academia, and female students face a similar threatening experience in math and science.

In 1995, Steele and Aronson confirmed that stereotype threat played a direct role in African American standardized test scores. Since this groundbreaking research, other studies have found similar effects with low-income (Croizet & Claire, 1998), Hispanic (Gonzales, Blanton, & Williams, 2002), and female (Shapiro & Williams, 2012) students. In their 2009 work, Good and colleagues examined several strategies to reduce the impact of stereotype threat on standardized testing. In the study, students in the seventh grade were mentored by students in college. The college students encouraged their mentees to view intelligence as malleable, to attribute academic difficulties to the newness of the situation, or a combination of both. Researchers found that female students in all three groups achieved significantly higher math test scores than females in the control condition (Good et al., 2009). Further, Hispanic and low-income students' reading test scores significantly increased if they had learned about the malleability of intelligence. These findings have implications for test preparation in the classroom. If teachers and parents are made aware of the effects of stereotype threat and taught to counter them with growth and malleability messages, it is likely that the gap in test scores between African American and Hispanic students and their Caucasian counterparts as well as the gap between male and female students in math and science testing will be significantly reduced.

CONCLUSION

Standardized testing has been a part of public education for decades. Recent trends suggest that standardized tests, like the ACT, will continue to become an even more important part of the education process and an even greater determinant to both teacher and student success. While many test preparation strategies and resources are available, several of the more common preparation strategies are minimally effective. In considering the above research, it is likely that educators will need to begin to implement more authentic teaching and inquiry-based strategies into test prep and focus less on coaching students on particular items and developing test taking skills. Other means of effective test preparation are gradually coming to light, helping students to minimize the impact of stereotype threats and to maximize the impact of achievement and motivation.

REFERENCES

Allensworth, E., Correa, M., & Ponisciak, S. (2008). From High School to the Future: ACT Preparation–Too Much, Too Late. Chicago, IL: Consortium on Chicago School Research.

Briggs, D. C. (2001). The effect of admissions test preparation: Evidence from NELS-88. Chance, 14(1), 10-18.

Briggs, D. C. (2009). Preparation for College Admission Exams. Arlington, VA: National Association for college Admission Counseling.

College Board (2013). A profile of SAT program test takers [On-line]. 2013 College-Bound Seniors. Retrieved from: http://research.collegeboard.org/programs/sat/data/archived/cb-seniors-2013

Croizet, J., & Claire, T. (1998). Extending the concept of stereotype and threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. Personality and Social Psychology Bulletin, 24(6), 588–594.

Dewey, J. (1902). The Child and the Curriculum. Chicago, IL: University of Chicago Press.

Gonzales, P. M., Blanton, H., & Williams, K. J. (2002). The Effects of stereotype threat and double-minority status on the test performance of Latino women. Personality and Social Psychology Bulletin, 28, 659-670.

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. Applied Developmental Psychology, 24(1), 645-662.

Kalchman, M. (2011). Using the math in everyday life to improve student learning. Middle School Journal, 43(1), 24-31.

National Assessment of Educational Progress. (2012). National Assessment of Education Progress Long-Term Trend Assessments 2012. Retrieved from: http://nces.ed.gov/nationsreportcard/ltt/

National Center for Education Statistics (2011). The Nation's Report Card: America's High School Graduates (NCES 2011–462). Washington, DC: U.S. Department of Education, National Center for Education Statistics, Institute of Education

National Middle School Association. (2010). This We Believe: Keys to Educating Young Adolescents. Westerville, OH: Author.

Powers, D. E., & Rock, D. A. (1999). Effects of coaching on SAT I: reasoning test scores. Journal of Educational Measurement 36(2), 93-118.

Schneider, R. M., Krajcik, J., Marx, R.W., & Soloway, E. (2002). Performance of students in project-based science class rooms on a national mea-sure of science achievement. Journal of Research in Science Teaching, 39(5), 410-422.

Scholes, R. J., & Lain, M. M. (1997). The effects of test preparation activities on ACT assessment scores. Retrieved from ERIC database. (ED409341)

Shapiro, J. R., & Williams, A. M. (2012). The role of stereotype threats in undermining girls' and women's performance and interest in STEM fields. Sex Roles, 66(3-4), 175-183.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. American Psychologist, 52(6), 613-629.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. Journal of Personality and Social Psychology, 69, 797-811.

Turner, M. J., & Rios, J. M. (2008). Determining paths to success: Preparing students for experimental design questions on standardized tests. The American Biology Teacher, 70(3), 140, 142-143, 145-152.

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