Teaching Test-Wisenedness in Elementary School:
Evaluation of a Pilot Small Group Intervention
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Abstract

The purpose of this project was to test the effectiveness of a pilot small-group intervention designed to raise the Oregon Assessment of Knowledge and Skills (OAKS) Reading Test scores of participants with minimal expense or disruption to existing school operations. Five fourth-grade students participated in the Testmasters Club (TC), which consisted of two hours of small-group instruction and practice with specific test-taking skills. Study results indicate that participants increased their knowledge of skills related to test-wiseness and were more likely to report that test taking was a personal academic strength post-intervention. Participants were also more likely to achieve OAKS Reading score increases than non-participants. Though results of this pilot project are promising and invite further investigation, caution should be exercised in interpreting the data due to the limited sample size of the populations involved.

Keywords: testing, test wiseness, standardized academic assessments, test preparation, elementary school counseling
Introduction and Literature Review

Annotated Bibliography


This article replicated the Ellis and Ryan study (2003) and found similar results. The authors suggest that teaching students how and when to use effective test-taking skills may be effective in reducing the racial achievement gap. The article also suggests that research on the effects of test-wiseness is best done using an experimental, rather than correlational approach.


The authors argue that the gap in achievement on standardized tests between African-American and white college students exists in part due to the fact that African-Americans on average has fewer opportunities to develop test-taking skills. African-American study participants employed more ineffective strategies while taking standardized cognitive tests; researchers claim this is a significant mediating factor.


The author of this article presents an argument for the importance of teaching test-taking skills to elementary school students and provides several test-taking strategies and pieces of advice. I can use these in the development of my curriculum.

This article, written for school administrators, presents a list of twelve ways to raise test scores. One of these ways is integrating instruction on test-taking skills into the curriculum.


This article defines test-wiseness as “a subject’s capacity to utilize the characteristics and formats of the test and/or the test taking situation to receive a high score. Test-wiseness is logically independent of the examinee’s knowledge of the subject matter…”. This definition is frequently cited in research articles on test-taking and captures a central skill that my intervention targets.


This article evaluated the metacognitive processes of students in grades 3-5 (ages 9-12) during repeat administrations of a science test. Results showed that students who crossed out incorrect answers before selecting their response were able to improve their test scores, especially the 11 and 12 year olds. The authors present evidence that a student’s ability to use this strategy during testing is a developmental skill that is positively correlated with test achievement independent of subject area knowledge.


This article provides a metaanalysis of existing research on the efficacy of elementary school programs aimed at teaching test-taking skills. The authors found that these
programs overall had a treatment effect size of .10, barely significant. However, several factors were shown to increase the effect size. Programs were most effective for students if they contained four hours or more of instruction time and were provided to students in grades 4-6. Also, students of low socioeconomic status (SES) benefitted more from training than students from higher income families, but only if they received four hours or more of training. The authors conclude that the effects of teaching test-taking skills are relatively small, but significant and cost effective in certain populations. The authors also note the limited amount of research in this area at the time, and call for further investigation into the effectiveness of such training.

Based on this article, I chose my intervention to be 3 hours long, which, in addition to the in-class skill training that all students receive, means that participants will receive at least 4 hours of test-taking training in the period between OAKS Reading test administrations. My school population is of low SES, and I will present my intervention to fourth graders.


Students who are served by a comprehensive counseling and guidance program based on the ASCA model are higher academic achievers than those who are not. This fact is useful at shaping public perception of school counseling programs and for justifying department funding. The authors go on to claim that elementary students can benefit from a “how to succeed in school” campaign that teaches test-taking strategies, among other skills. The authors also claim a need for simple pre and post test measures of counseling-initiated interventions that target academic competencies. The article states
that the school counselor should not be held primarily responsible for efforts to increase standardized test scores, but should support schoolwide efforts in this area through classroom guidance activities and small-group counseling.

**General Summary**

*Standardized Academic Testing and the Role of School Counselors*

Standardized academic assessments are of critical importance to educators, as student performance on such tests is a central measure of school success and carries significant weight in determining a school’s funding levels (No Child Left Behind, 2003). The Oregon Department of Education increased minimum passing Reading scores between 2010-11 and 2011-12, adding pressure on educators to ensure high marks (ODE). Aside from the issue of funding, a student’s ability to perform well on tests is a skill that will result in increased academic and career opportunities throughout the lifespan (Anastasi, 1986). As such, counselors who are able to deliver effective interventions that lead to increased test scores as evidenced by simple pre and post-test measures will prove their value to fund-allocators while serving their students in a meaningful way (Sink, 2003).

*Defining “Test-wiseness”*

Millman, Bishop, and Ebel (1965) define test-wiseness as “a subject’s capacity to utilize the characteristics and formats of the test and/or the test taking situation to receive a high score”. This definition is frequently cited in decades of subsequent research in this area and accurately captures the skill targeted by my intervention. Skills that fall under the umbrella of test-wiseness include the careful reading of directions, intelligent guessing, and the wise use of time (Ligon, 1983). It is important to understand that the concept of test-wiseness is unrelated to the test-taker’s knowledge of the subject matter,
yet positively correlates to test performance overall (Roebers, 2009; Sink, 2003). This fact makes teaching test-wiseness an appropriate and worthwhile task for school counselors, who are charged with helping students to develop academic skills, but should not teach core subject matter directly (ASCA, 2003; Hoover, 2002). Sink (2003) argues that school counselors should not be held primarily responsible for efforts to increase standardized test scores, but can support schoolwide efforts in this area though classroom guidance activities and small-group interventions that target academic competencies.

Demographic Factors

Scruggs, White, and Bennion (1986) performed a metaanalysis of existing research on the efficacy of elementary school programs aimed at teaching test-taking skills and found that such programs were most effective for students in grades 4-6. This study also notes that students from low socioeconomic status benefitted more from test-taking skill groups than their counterparts from higher income families. In addition, several studies provide evidence that programs that teach test-wiseness are especially effective for African-American students and can be used as a tool for reducing the racial achievement gap in education (Dollinger, 2012; Ellis & Ryan, 2003). Also, test-wiseness has been shown to be an effective compensatory tool for test-takers with limited English proficiency, which helps to minimize the impact of language on assessment performance (Cohen, 2006). The linguistically and culturally diverse, economically disadvantaged student population at Earl Boyles Elementary (EBE) made it a fitting site for my project.

Test-wiseness Skills

Numerous articles provide specific suggestions for how to teach test-wiseness to elementary students (Allan, 1992; Beidel, Turner, & Taylor-Ferreira, 1999). Roebers
(2009) evaluated the metacognitive processes of students during repeat administrations of a standardized science test; this study concluded that students who crossed out incorrect answer possibilities before choosing their final response were able to improve their results, especially students aged 10-11. This report, and other studies that found similar conclusions, led me to focus heavily on the skill of process-of-elimination in designing my curriculum (Allan, 1992; Rozonowski, 1992). Research indicates that reading the questions before the preceding text helps students to anticipate important information and is positively linked to test performance (Farr, 1990; Priestly, 2000). In addition, strategies for deducing vocabulary meaning based on context is a skill that is particularly important for English Language Learners (ELL), who comprise a relatively high percentage of the student population at EBE (Allan, 1992; Cohen, 2006; Lingyun, 2011). The aforementioned skills served as the basis for my curriculum.

Methodology

Fourth grade students at EBE in Portland, OR who scored within the category of “Almost Meets” on the first administration of the OAKS test, taken in February 2013, were eligible for inclusion in the TC. Twelve students fell within this category. Five of these twelve returned consent forms prior to the group’s start date; all five students were selected for inclusion. The seven students who did not return the required paperwork did not receive services and thus constitute the control group for this experiment. No consideration was given to demographic factors or status as an ELL or Special Education student.
I provided four half-hour sessions of instruction and guided practice in test taking skills and strategies; this curriculum was presented during the three weeks preceding the second administration of the OAKS Reading test of the 2012-13 school year. Each session consisted of a short lecture on the day’s topic, followed by guided practice using reading test passages similar to those contained in the OAKS assessment. An overview of the course structure is found below:

- **Session One**: Pre-test/ Anticipating Critical Information
- **Session Two**: Process of Elimination for Multiple Choice Questions
- **Session Three**: “Guessing” Vocabulary from Context
- **Session Four**: Skill Review and Practice/ Post-test

The impact of the TC was evaluated based on two data sources: 1) a researcher-designed pre and post-test survey with a Likert scale, and 2) OAKS Reading scores from both administrations of the 2012-13 school year, taken by fourth-grade students in February and in May.

**Data and Results**

**Pre and Post Survey: Paired T-Test**

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>4, 4</td>
<td>4, 5</td>
<td>3, 5</td>
<td>3, 4</td>
</tr>
<tr>
<td>Participant 2</td>
<td>3, 4</td>
<td>5, 5</td>
<td>4, 4</td>
<td>5, 5</td>
</tr>
<tr>
<td>Participant 3</td>
<td>3, 4</td>
<td>5, 5</td>
<td>4, 5</td>
<td>5, 5</td>
</tr>
<tr>
<td>Participant 4</td>
<td>4, 5</td>
<td>3, 4</td>
<td>3, 5</td>
<td>2, 4</td>
</tr>
<tr>
<td>Participant 5</td>
<td>2, 3</td>
<td>1, 4</td>
<td>2, 3</td>
<td>1, 4</td>
</tr>
<tr>
<td>M (pre, post)</td>
<td>3.20, 4.00</td>
<td>3.60, 4.60</td>
<td>3.20, 4.40</td>
<td>3.20, 4.40</td>
</tr>
<tr>
<td>Σ</td>
<td>.84, .71</td>
<td>1.67, .55</td>
<td>.84, .89</td>
<td>1.79, .55</td>
</tr>
<tr>
<td>( P )</td>
<td>0.0161</td>
<td>0.2398</td>
<td>0.0327</td>
<td>0.1087</td>
</tr>
</tbody>
</table>

*Item Rating Scale: 1- Strongly Disagree; 2- Disagree; 3- Neutral; 4- Agree; 5- Strongly Agree*

Students in the TC completed a 4-item pre and post-survey to measure attitudes and confidence in certain skills central to the construct of test-wiseness. The Likert-items comprising this survey are as follows:
1) Test taking is one of my strengths in school.
2) Getting rid of the wrong choices first will help me choose the right answer.
3) If I don’t know what an important word means, I can figure it out using the other words around it.
4) I should read the questions that follow a text before I read the text itself.

Mean values for all four items rose post-intervention, with questions 1) and 3) showing statistically significant growth. There was no item-score regression by any of the students, though not all students reported advancement on all measures. Results from this instrument indicate that participants were able to strengthen personal test-wiseness through participation in the TC. In addition, participants were significantly more likely to feel that test taking was one of their academic strengths post-intervention.

**OAKS Reading Scores: Group Comparison**

<table>
<thead>
<tr>
<th></th>
<th>OAKS Rdg. 1</th>
<th>OAKS Rdg. 2</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>210</td>
<td>216</td>
<td>6</td>
</tr>
<tr>
<td>Participant 2</td>
<td>210</td>
<td>219</td>
<td>9</td>
</tr>
<tr>
<td>Participant 3</td>
<td>210</td>
<td>213</td>
<td>3</td>
</tr>
<tr>
<td>Participant 4</td>
<td>211</td>
<td>232</td>
<td>21</td>
</tr>
<tr>
<td>Participant 5</td>
<td>210</td>
<td>203</td>
<td>-7</td>
</tr>
<tr>
<td>μ Participants</td>
<td>210.40</td>
<td>216.60</td>
<td>6.40</td>
</tr>
<tr>
<td>μ Non-Participants</td>
<td>213.67</td>
<td>214.22</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**OAKS Reading Scores by Achievement Category**

<table>
<thead>
<tr>
<th></th>
<th>Participants (N=5)</th>
<th>Non-Participants (N=9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Scores</td>
<td>4 (80%)</td>
<td>4 (44%)</td>
</tr>
<tr>
<td>Met State Standard</td>
<td>3 (60%)</td>
<td>2 (22%)</td>
</tr>
<tr>
<td>Exceeded Standard</td>
<td>1 (20%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Of the five student participants, four (80%) increased their OAKS Reading scores on the test’s second administration. Three students scored in the Meets category (60%), while one Exceeded standards. In comparison, four of the nine (44%) eligible students who did not participate in the program achieved score increases. Two non-participants
(22%) met standards, while none exceeded standards. The average change in scores achieved by participants was +6.40, while the average change in scores for non-participants was +.55. This data provides tentative evidence that the TC was effective in raising OAKS Reading scores, though more data points are needed to solidify this link.

Discussion

The TC was a pilot project with a modest scope, and modestly should be exercised when interpreting the results. Pre and post-test data clearly indicate that the TC was effective in increasing participants’ working knowledge of critical skills related to test-wiseness, and that these students felt more confident in their test-taking abilities after completing the course. However, the limited sample size of both the experimental and control groups means that it is not possible to exclusively attribute the observed OAKS Reading score increases to my intervention.

Because of the limited populations involved in this project, anomalous scores, whether in the control or experimental group, carry significant weight. For example, the lone participant who scored lower on the second OAKS test was a Special Education (SPED) student, which may have affected his or her potential to benefit from the curriculum. Similarly, a non-participating student was absent several days leading up to the second test, which may have impacted the mean values of the control population. It is impossible to identify or quantify the effects of all such factors, which would offset each other given a larger data pool and the near-randomized selection process employed my research design.
Pinpointing the exact mechanisms that contributed to observed score increases is also problematic. (I am assuming here, for the sake of argument, that the increases are attributable to the TC.) The primary goal of the TC was to teach specific skills; however, students also reported increased self-efficacy as a secondary effect. It is unclear whether participants overall scored higher post-intervention because they were able to successfully employ the targeted skills, or simply because of increased confidence gained through focused, positive adult interaction.

In summary, this project yielded results that are initially promising, but further investigation must be conducted to produce firmer conclusions. However, as a pilot project, the TC was successful in producing preliminary evidence that such programs can be effective for school counselors who wish to support schoolwide efforts to increase test performance. It is clear that students who received intervention services as a whole gained confidence in their test-taking abilities and acquired knowledge and skills shown in the research to positively correlate to test-performance. However, the hypothesis that the TC will translate to concrete student improvement on specific standardized measures of academic performance remains inconclusive. I recommend that future researchers replicate this pilot project in order to further assess its value as a tool for elementary school counselors. Special attention should be given to the role of self-efficacy as well as the intervention’s relative potential to benefit student populations with unique needs (e.g. ELL, SPED).
References


Appendix: Portland State University Institutional Review Board Proposal