

# Board of Education Agenda Item

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Date: January 14, 2010

Topic: Progress Report on Analyses Aimed at Understanding College Readiness in Virginia

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## Origin:

Topic presented for information only (no board action required)

Board review required by

State or federal law or regulation

Board of Education regulation

Other: \_\_\_\_\_

Action requested at this meeting  Action requested at future meeting: \_\_\_\_\_

## Previous Review/Action:

No previous board review/action

Previous review/action

date \_\_\_\_\_

action \_\_\_\_\_

## Background Information:

In January 2007, the Virginia Board of Education authorized the Virginia Department of Education (VDOE) to conduct studies to identify key indicators of college readiness that may be used to develop measures that identify students as likely prepared for postsecondary educational programs. Since that time, the Department has been engaged in several analytic efforts related to understanding indicators that suggest students are academically prepared for postsecondary educational success when they leave high school. The primary goal of the studies listed below is to understand the relations between achievement as measured state end-of-course assessments (SOL tests) and postsecondary success:

1. Analysis of the relation between SOL scores and Scholastic Aptitude Test (SAT) scores.
2. Analysis of the relation between SOL scores and postsecondary enrollment and persistence.
3. Analysis of the relation between SOL scores and postsecondary academic outcomes, including participation on postsecondary developmental coursework and course grades in postsecondary educational programs.

Below is a summary of the progress of the analyses conducted so far, including results where applicable. VDOE has briefly described the barriers encountered that have slowed the state's forward progress in this analytic work, new approaches being used to overcome barriers and get the much needed work done, and additional work the education agencies plan to conduct in the future.

## Summary of Major Elements

### **Analysis of the relationship between SOL scores and Scholastic Aptitude Test (SAT) scores**

The Virginia Department of Education, with technical assistance from the Regional Educational Laboratory Appalachia (REL-A), conducted statistical analyses designed to understand the associations between SOL outcomes and outcomes on the SAT. VDOE acquired student-level SAT scores from the College Board, matched the data to state SOL assessment results, and considered various relations between the two. Primary results showed:

- Correlations between the mathematics SAT and SOL mathematics assessments are moderate to high, 0.54, 0.59, 0.69 for Algebra I, Algebra II, and Geometry, respectively, for the graduating class of 2006.
- Correlations between SAT verbal and SOL reading and writing end-of-course assessments were moderate, 0.48 and 0.45, respectively, with similar correlations between SAT writing and SOL reading and writing end-of-course assessments.

The College Board has established the following college-ready benchmarks on the SAT:<sup>1</sup>

- Low-benchmark describes students who have a 65 percent chance of earning a 2.0 grade point average (GPA) in their first year of college.
- High-benchmark describes students who have a 65 percent chance of earning a 2.7 GPA in their first year of college.

Using this information, VDOE assessed the association between scoring at or above the college-ready benchmarks and performance on the English and mathematics SOL end-of-course assessments. Results showed that nearly all students who scored at the advanced proficient level on the SOL assessments in mathematics, reading and writing met or exceeded the College Board's low-benchmark on the SAT, and between 40 and 50 percent of students who scored advanced proficient on the SOL tests scored at or above the College Board's high benchmark on the SAT. Few students (10 percent or less) who scored at the proficient level on the SOL met the high benchmark on the SAT.

Taken together, the results suggest that performance on the SOL test and the SAT are related, and that advanced proficiency in particular is associated with the College Board's definition of college ready.

### **Analysis of the associations between SOL scores and postsecondary enrollment and persistence**

VDOE contracted with researchers at Virginia Tech to study the association between SOL performance and postsecondary enrollment as documented by data acquired from the National Student Clearinghouse (NSC). The NSC data document students' enrollment in and completion of programs in postsecondary institutions across the country; the NSC enrollment data include 92 percent of students enrolled in postsecondary institutions in the United States. The data are limited in that they do not provide any information on students' course-taking patterns or course outcomes (i.e., grades).

Phase I focused on the association between SOL scores and postsecondary enrollment in two-year and four-year institutions. As well, researchers considered how postsecondary enrollment varies by student groups or other variables available from VDOE, such as diploma type. Phase II, which remains ongoing, is focused on understanding how SOL scores relate to students' successful persistence into their second year of postsecondary education.

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<sup>1</sup> Kobrin, J. L. (2007). Determining SAT benchmarks for college readiness. (College Research Note No. RN-30). New York, NY: College Board.

While the results of enrollment in two-year institutions are interesting, the meaning of these outcomes is unclear because such a large percentage of students who enroll in two-year schools participate in developmental (remedial) coursework—approximately 45 percent of students enrolled in Virginia’s two-year postsecondary colleges require developmental education in English or mathematics each year. In comparison, approximately three percent of students enrolled in Virginia’s four-year institutions require developmental education. Therefore, without the ability to connect enrollment to student outcomes, the findings presented here are limited to those from students who enrolled in four-year institutions.

Key findings available thus far from the students who graduated or completed high school in 2007 show:

- Forty-one and a half (41.5) percent of students in the graduating class of 2007 enrolled in four-year postsecondary institutions within two years of completing high school.
- Seventy (70) percent of students who earn advanced studies diplomas enroll in four-year postsecondary institutions, whereas only 16 percent of students who earn standard diplomas attend four-year postsecondary institutions.
- Students who completed Virginia’s Early College Scholars agreements and earned Early College Scholars certificates were more likely to enroll in four-year schools within two years of graduating high school, 85 percent and 89 percent, respectively.
- Sixty (60) percent of students who were dually-enrolled in secondary and postsecondary institutions in high school enrolled in four-year postsecondary institutions within two years of graduating from high school.
- Students who graduated high school in 2007 and earned advanced proficiency on the Algebra II SOL assessment had a 79 percent probability of enrolling in four-year institutions.
- Students who scored advanced proficient on the reading SOL had a 64 percent chance of enrolling in four-year institutions and students who scored advanced proficient on the writing assessment had a 72 percent chance of enrolling in four-year institutions.
- Students who scored at the proficient level on end-of-course assessments EXCEPT Algebra II and chemistry assessments had at most a 45 percent probability of enrolling in four-year institutions; students who earned proficient scores on the Algebra II and chemistry assessments had a 50 and 59 percent probability of enrolling in four-year institutions.

Analyses of the association between SOL assessments and persistence in postsecondary educational programs are still in progress. Initial work to understand how persistence relates to postsecondary enrollment shows that:

- Of students who enroll in four-year institutions across the country (as measured with data from the National Student Clearinghouse), nearly 87 percent persist into their second year.
- Once students enroll in four-year postsecondary schools, SOL scores from high school are not meaningful factors to distinguish between the students who persist into their second year and students who leave—other factors must be investigated to understand the factors that lead students out of four-year institutions.
- For the high school graduating class of 2006, approximately 20 percent were enrolled in two-year institutions within one-year of graduating from high school.
  - a. Nineteen (19) percent of students who enrolled in two-year postsecondary institutions within one-year of completing high school transferred to a four-year institution within three years of graduating high school.
  - b. Approximately 24 percent of the students who enrolled in two-year postsecondary institutions within one year of completing high school had either earned a credential *or* transferred to four-year institutions before the end of academic year 2008-2009.

Students with higher scaled scores on the SOL tests were more likely to transfer to a four-year school *or* earn a credential.

### **The association between SOL scores and postsecondary academic outcomes**

The completed analyses on SAT and postsecondary enrollment, coupled with results from national studies, suggest that students who meet one or more of the following criteria are likely to be successful in postsecondary work at four year institutions:

1. Students who earn an advanced studies diploma in Virginia;
2. Students who participate in Virginia's Early College Scholars program;
3. Students who take Algebra II and chemistry in high school and earn advanced proficient or close to advanced proficient scores on these and the SOL end-of-course reading and writing assessments.
4. Students who score at or above college-ready benchmarks established on the SAT and ACT.<sup>®</sup>

There may be other indicators of successful preparation for postsecondary education in Virginia. Without access to data that directly link high school student achievement data to postsecondary course enrollment, Virginia has limited information about how other outcomes are associated with postsecondary success. In particular, data linked between VDOE and SCHEV are critical to understanding the associations between high school achievement and success in two-year institutions. For example, is there an analytically derived profile or set of SOL scores and high school course taking patterns that are associated with student success in postsecondary? Can SOL assessment scores reliably predict students' preparation for college-level coursework, eliminating the need for placement tests for students who attend community colleges?

To answer these and other questions, VDOE and SCHEV have been working together for several years to determine how data from the agencies can be merged for analytic purposes. This work required VDOE and SCHEV to work through the technical (i.e., data-related) issues that would permit the data to be linked. As well, the agencies worked together to develop a methodology that permits de-identified data to be reliably merged at the student level. That is, the merge methodology removed all information from the dataset that could identify individuals, including names, social security numbers, and dates of birth. This methodology, coupled with language in the state Appropriation Act, are considered sufficient to meet the requirements of federal and state privacy laws to permit the separate agencies to merge the data.

The agencies are in the process of merging and analyzing the data. However, there are significant limitations regarding the first available data sets for merging. The first data sets for which there are sufficient variables that are available for linking between the two agencies are limited to students who have participated in SAT testing. This excludes the vast majority of students who enroll in two-year programs and who are more likely to participate in developmental education. This data sample is, however, likely to provide a representative sample of students who enroll in four-year institutions. Therefore, the results of the first analysis are expected to provide further validation of the results from the analyses of SAT and postsecondary enrollment analyses described above, but are not expected to be useful for understanding other issues, particularly those related to developmental education.

More comprehensive data with sufficient variables for linking between VDOE and SCHEV will be available for merge in spring 2010. The timeline below describes the agencies' time frame for completing analyses on the initial, limited data set and the more comprehensive data set that will become available in the future.

- January 2010:
  - Complete descriptive analyses to validate the initial, limited data set merged between

- VDOE and SCHEV.
- Determine the representativeness of the initial, limited data set available for analysis.
  - February 2010, using the initial, limited data set:
    - Develop programming requirements to conduct inferential analyses that describe the association between high school achievement as measured by participation in and outcomes on SOL assessments ;
    - Develop preliminary profile of high school indicators, including SOL assessment outcomes, that are associated with student enrollment and success in the first year of postsecondary education;
    - Based on the representativeness of the sample, describe the limitations of the study results.
  - Spring 2010:
    - SCHEV will complete data collection that permits a more comprehensive set of data to be linked to VDOE's data.
    - Third party to merge the de-identified data from SCHEV and VDOE for analytic use.
  - May-June 2010:
    - Conduct inferential analyses to analyze the association between high school achievement indicators (SOL participation and outcomes) and postsecondary outcomes in Virginia.
    - Develop profile of high school indicators including SOL assessment outcomes that describe the outcomes of students who have a high probability of being successful in postsecondary education.
    - Develop qualitative descriptions of student achievement that are consistent with the high school indicators of postsecondary readiness.
  - June - July 2010:
    - Present recommendations to the Virginia Board of Education and other relevant stakeholders on high school indicators of postsecondary success.
    - Present plan to conduct ongoing validation studies and updates to the SOL profile and factors associated with postsecondary readiness.

**Superintendent's Recommendation:**

The Superintendent of Public Instruction recommends that the Board of Education accept this report for informational purposes.

**Impact on Resources:**

The Department of Education has the resources to conduct the work described herein.

**Timetable for Further Review/Action:**

None