Annotated Bibliography of Research for the State Board of Education Oregon Diploma Discussion

January 2007

Over the last eighteen months the State Board of Education has been discussing high school diploma requirements. To support the Board's efforts, the Department of Education has provided the Board with background documents and recommendations to aid their discussion. The documents were prepared utilizing a wide array of research-based evidence, statistical studies and expert opinions.

What follows is a partial list of some of the sources cited. To make a full listing of the papers, publications and reports would lengthen this list considerably. Many of the sources given below were footnoted in Board docket items. Others were used to inform department documents, even if not specifically cited in Board materials.

The sources fall into several categories. The first category consists of research papers and reports that are based on experimental or quasi-experimental studies or statistical studies of either census or long-term trend data or significant populations. The second category consists of surveys of current policy and practice. The third category consists of reports from various educational organizations who also synthesize the available research to arrive at recommendations.

Research Publications: These reports are based on studies of national or state education data; longitudinal data for large cohorts; or results of experimental or quasi-experimental research conducted on smaller populations.

- National Center for Education Statistics. 1997. *Access to Postsecondary Education for 1992 High School Graduates,*

  This report uses data from the National Education Longitudinal Study of 1988 (NELS:88) to examine access to postsecondary education of 1992 high school graduates by 1994, two years after high school graduation. The report study considered family income, race-ethnicity, parental levels of education, college costs and financial aid, student educational expectations and academic preparation, among other factors.
  Major Finding: Indicates that roughly 70% of high school graduates enter college within a year. This finding has been substantiated by numerous findings since 1997. See the next citation.

- Oregon University System. 2005. *Where Have Oregon's Graduate's Gone? Survey of the Oregon High School Graduating Class of 2004.*

  This report is based on a survey of recent graduates from Oregon High Schools. It indicates postsecondary attendance patterns of the graduating class.
  Major Finding: More than 70% of Oregon high school graduates immediately enroll in post secondary education and many of those who don't enroll have postsecondary education as an aspiration.

- The American Diploma Project. 2002. *Connecting Education Standards and Employment: Course-taking Patterns of Young Workers. Data based on the NELS:88 study.*

  Examined high school course taking patterns of sophomores in 1990 (eventual class of 1992) and their place in the workforce by 2000 by job class and salary.
  Major Findings: Algebra 2 is a gateway course for students to enter well-paid skilled white collar or professional jobs. Geometry is the gateway for well-paid skilled blue-collar jobs. Taking grade-level English, as opposed to remedial English coursework had a similar correlation.

- National Center for Education Statistics. 2003. *Remedial Education at Degree-Granting Postsecondary Institutions in Fall 2000.*
  This report provides national estimates remedial course enrollment in degree-granting institutions in fall 2000 and changes from fall 1995. The report compares course offerings, student participation in remedial programs, institutional structure of remedial programs, and the delivery of remedial courses through distance education.
  Major Finding: 40% of students in post secondary education require remediation.

- Adelman, C. *Principal Indicators of Students Academic Histories in Postsecondary Education, 1972-2000.* U.S. Department of Education.
  This document is a descriptive account of the major features of the postsecondary academic experience during the period 1972-2000, with an emphasis on the period 1992-2000. Report includes data on college enrollment, degree attainment, remediation rates, and other factors, with data diaggregated by both socioeconomic and by race and ethnicity.
  Major Findings: Among the many findings are high remediation rates (around 40%), as well as high rates of post secondary study (78% of graduates enroll at some time after high school.)

- Adelman, C. 1999. *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment.* U.S. Department of Education.
  Perhaps the most commonly cited study in the citations given in the third section of this bibliography. Discussed what contributes most to long-term bachelor's degree completion of students who attend 4-year colleges (even if they also attend other types of institutions). Studies high school and college transcript records, test scores, and surveys of a national cohort from the time they were in the 10th grade in 1980 until roughly age 30 in 1993.
  Major Findings: Study shows that rigor of coursework, especially the completion of Algebra 2, is the most important factor in degree completion. This correlation is even more pronounced for minority populations.

- Adelman, C. 2006. *The Toolbox Revisited: Paths to Degree Completion from High School Through College.* U.S. Department of Education.
  The Toolbox Revisited follows a nationally representative cohort of students from high school into postsecondary education, and asks what aspects of their formal schooling contribute to completing a bachelor's degree by their mid-20s. Studies students who attended a four-year college at any time, thus including students who started out in other types of institutions, particularly community colleges.
  Major Findings: The academic intensity of the student's high school curriculum is the most important factor contributing to student completion of a bachelor's degree.

- American Federation of Teachers Policy Brief. 1999. *Lessons from the World: What TIMSS Tells Us About Mathematics Achievement, Curriculum and Instructions.*
  Reviewed the Trends in Mathematics and Science Study (TIMSS) results of 1999 that show math and science achievement in the U.S. lags that of other industrial nations, especially at the high school level. U.S. 12th grade math achievement exceeded only Cyprus and South Africa, among nations studies.
  Major Findings: The U.S. needs a more focused curriculum, more rigorous content and more student accountability for reaching the standards.

- Schmidt, W., Houang R., Cogan, L. 2002. *A Coherent Curriculum: The Case of Mathematics.*
  Compares mathematics content, rigor and sequences of mathematics curriculum in high achieving TIMSS (Trends in International Math and Science Study) countries to typical state standards in the U.S.
  Major Findings: International standards for high achieving countries tend to cover fewer topics each year and in greater depth, in a sequence that shows clearer progression of skills. In comparison, U.S. content is less demanding and more repetitive. Algebra 1 is viewed as a middle school subject by most of these countries.

- American Institutes of Research. 2005. *Reassessing U.S. International Mathematics Performance: New Findings from the 2003 TIMSS and PISA.* U.S. Department of Education.

  The Trends in International Math and Science Study results are restricted to the 12 countries that have participated in 4th grade TIMSS, 8th grade TIMSS and 9th grade PISA (Program for International Student Assessment): Australia, Belgium, Hong Kong, Hungary, Italy, Japan, Latvia, Netherlands, New Zealand, Norway, the Russian Federation and the United States. This study analyzed key features of the three tests to determine more detailed comparisons among the countries.
  Major Findings: In this group the U.S. ranked 8th, 9th and 9th respectively on the three assessments. The U.S. students strongest area was data and statistics, and the weakest were measurement and geometry.

- Hallinan, M. 2002. *Ability Grouping and Student Learning.* Brookings Papers on Educational Policy.

  Examined data from approximately 2,000 high school students. The 9th grade English and Mathematics test scores that the students actually received are compared to predicted test scores based on placement in a higher or lower ability group.
  Major Findings: Regardless of the initial achievement level, assigning a student to a higher ability group increases the student's learning and assignment to a lower group depresses a student's learning regardless of the student's ability level. This study raises critical questions about whether American schools sufficiently challenge students to attain optimal performance.

- California Department of Education. 2005. *A Study of the Relationship Between Physical Fitness and Academic Achievement in California Using 2004 Test Results.*

  Studies the relationship between academic test scores and a fitness test score.
  Major Findings: There was a strong positive relationship between physical fitness and academic achievement. The relationship between fitness and achievement was stronger for females than for males and stronger for higher SES students than for lower SES students.

- The Arts Education Partnership. 1999. *Champions of Change: The Impact of the Arts on Learning, pp. 47-62.*

  In Chicago, inner-city schools with integrated arts curriculum were compared to those without and arts curriculum.
  Major Findings: The number of students performing at or above grade level in mathematics was as much as 20% higher in schools with an integrated Arts curriculum.

Analysis of Current State and Local Policies

Summaries of current state and local practices, as well as student achievement data. Recommendations are also given.

- Dounay, J.. 2006. *Ensuring Rigor in the High School Curriculum: What States are Doing.* Education Commission of the States.

  Reviews current policies aimed at increasing rigor for the high school diploma and identifies those policies that have a real effect on student achievement. Some policies intended to increase rigor do not necessarily translate into a more challenging curriculum.
  Major Findings: End-of-course exams, formative assessments, proficiency requirements, teacher professional development, and raising academic standards are the most effective policies.

- Council of Chief State School Officers. 2005. *Key State Education Policies on PK-12 Education 2004.*
  Summarized current (as of 2005) state policies regarding graduation requirements, content standards, teacher licensure and student assessments.
  Major Findings: Gives comparison of other state graduation requirements to our own, and gives the latest data on trends in raising rigor for high school expectations.

- ACT, Inc. 2005. *Crisis at the Core*: *Preparing All Students for College and Work.*
  ACT has developed college readiness benchmarks. These benchmarks are indicators of college success, (a 75% chance of earning a C or better in credit bearing core college courses) rather than college entrance.
  Major Findings: Less than half of ACT test-takers met the College Algebra benchmark and only one-fourth of the ACT test-takers met the benchmark for College Biology.

- ACT, Inc. 2005. *College Readiness Begins in Middle School.* ACT Policy Report.
  Examined the career and educational aspirations of middle school students and the amount of preparation towards those goals that occurs in middle school.
  Major Recommendations: Post secondary educational and career planning should begin in middle school. Many middle school students do not take the courses that prepare them for advanced high school classes.

- NACAC Admissions Trends Survey, 2001.
  Profiles trends in admission policies for U.S. colleges.
  Major Finding: Grades in college prep courses are the most important factor in admissions.

- College Entrance Examination Board. 2005. *2005 College-Bound Seniors: Total Group Profile Report* and *State of Oregon Profile Report.*
  This profiles SAT test takers, including their academic history and post secondary expectations, correlated with their SAT scores.
  Major Findings: There are strong correlations between SAT Verbal and Math scores and study in other subjects, such as the Arts and Second Language.

- ACT, Inc. 2005. *2005 ACT National and State Scores Report* and *State Composite for Oregon Report.*
  This profiles ACT test takers, including their academic history and post secondary expectations, correlated with their ACT scores.
  Major Findings: Shows strong correlation between rigor of coursework and scores on the ACT.

- Zinth, C and Dounay, J. 2006. *Mathematics and Science Education in the States.* Education Commission of the States.
  This report reviews state policy and identifies the types of policy activities most likely to impact the skills of teachers and student participation in advanced math and science.

Policy and Position Papers

These are often position papers by major non-profit organizations and provide syntheses of research studies in education, together with the organization's own conclusions and recommendations. Many of these sources have extended bibliographies.

- The American Diploma Project. 2004. *Ready or Not: Creating a High School Diploma That Counts.*
  Reviews data and research on student aspirations and actual achievement. Highlights the 90% of 8th graders aspire to post secondary education, but few achieve a degree.

Major Recommendations: States need to anchor their high school diploma expectations in the knowledge and skills that colleges and employers expect. States need to specify specific courses/content required for graduation.

- ACT, Inc. 2006. *Ready for College or Ready for Work: Same or Different?*
  A study that provide empirical evidence concerning whether planning to enter college or workforce training programs after graduation,
  Major Findings: High school students need to be educated to a comparable level of readiness in reading and mathematics to either succeed in college-level courses without remediation or to enter workforce training programs ready to learn job-specific skills.

- Achieve, Inc. 2005. *Rising to the Challenge: Are High School Graduates Prepared for College and Work.*
  A study of recent high school graduates, college instructors and employers to examine perceptions of student preparedness for college and the workforce.
  Major Findings: College Instructors and employers estimate that over 40% of the recent high school graduates they see are either are not prepared for college-level work or to advance beyond entry level jobs. Looking back, two-thirds of high school graduates would have taken more rigorous coursework, and would have worked harder if expectations were higher in high school.

- Carnevale, A. and Desrochers, D. 2003. *Standards for What? The Economic Roots of K-16 Reform.* Educational Testing Service.
  Reviews the shift in the U.S. economy toward jobs that require post secondary education. Correlates training and education with earnings potential. Lists the skills and abilities that employers want.
  Major Findings: For most Americans, education and training beyond high school is a necessary condition for developing skills required by most well-paying jobs. Workers in the best-paying jobs have typically completed Algebra 2 in high school.

- Venezia A., Kirst M., Antonio A. 2003. *Betraying the College Dream: How Disconnected K-12 and Postsecondary Education Systems Undermine Student Aspirations.* The Stanford Bridge Project.
  Examined the gap between student post secondary expectations in 8th grade and actual post secondary enrollment. Oregon was one of six states studied for the report.
  Major Findings: States create unnecessary barriers between high school and college. These can be lowered through alignment of K-12 standards and postsecondary placement exams, linking senior year courses to post secondary general education courses, and expanding dual enrollment to include all students, not just college-bound students.

- Public Agenda. 2002. *Reality Check 2002.*
  Includes data from a survey of professors and employers regarding the skills of recent high school graduates.
  Major Findings: A substantial majority of respondents rated the typical high school graduate as "fair" or "poor" in writing, grammar and basic math.

- National Commission on the High School Senior Year. 2001. *The Lost Opportunity of Senior Year: Finding a Better Way.*
  Studied the nature of the disconnect between K-12 and post secondary education, resulting remediation rates, low expectations for the senior year.
  Major Recommendations: The senior year often represents a year of decreased motivation and expectations. It should be the most rigorous year of high school, preparing students for the increased rigor of post secondary education.

- Achieve, Inc. 2004. *The Expectations Gap: A 50-state Review of High School Graduation Requirements*.
  Synthesized research reports on graduation rates, remediation rates in college, skill levels of recent graduates, policies of states with rigorous diplomas.
  Major Findings: Students taking more rigorous high school coursework are better prepared to succeed in college and the workforce.

- Achieve, Inc. 2005. *Oregon Data Profile.*
  Compares state data on Oregon students' progress through the education pipeline to other states and the nation. Provides data on high school diploma rates; high school coursework; and enrollment in college and degree completion.
  Major Findings: Oregon students continuation rates in the education pipeline are below the national average and lag significantly behind those of the top states. Oregon students are near or below the national averages in number of 8th graders taking Algebra and in national achievement in math and reading.

- National Research Council. 2006. *America's Lab Report: Investigations in High School Science (2005)*
  Reviews and gives recommendations regarding the instructional practices for high school science.
  Major Recommendations: Outlines the role of laboratory experiences in the 21st Century classroom as well as guidelines for proper conduct of laboratory experiences.

- Partnership for 21st Century Skills. 2005. *Results That Matter: 21st Century Skills and High School Reform.*
  Including participation by major companies such as Intel, Ford, Microsoft, Apple, TimeWarner, and the American Federation of Teachers, this group outlines a list of skills needed to be successful in the 21st century workforce.
  Major Recommendations: To ensure that high school graduates are ready for next steps, school reform needs to go beyond increasing the rigor of course requirements to include skills necessary for success in the new century.

- National Governor's Association for Best Practices. 2002. *The Impact of Arts Education on Workforce Preparation, Issue Brief.*

- Western States Arts Federation. 2000. *The Economic Impact of Oregon's Nonprofit Arts Sector.* Prepared for the Oregon Arts Commission.