



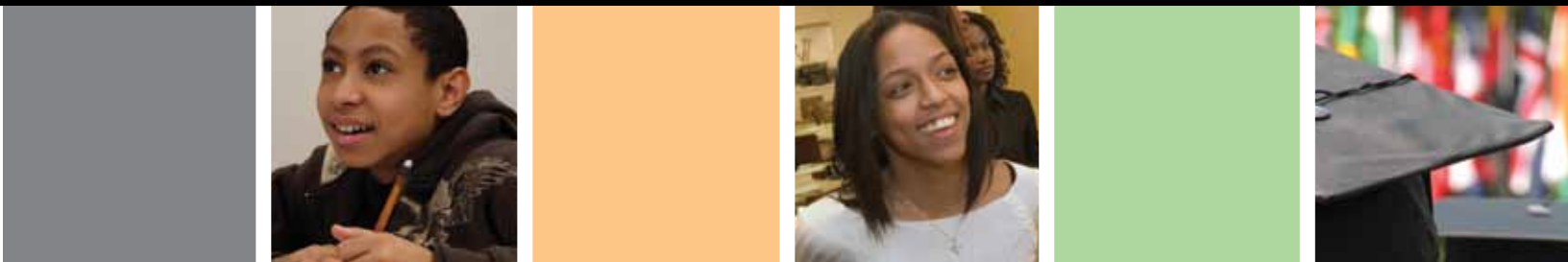
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IDEAS FOR THE FUTURE

Aligning Minnesota's Educational Systems to Prepare All Students for Higher Education and High-Skill Employment



A Summary of Conclusions Reached By Working Groups
of the Minnesota P-20 Partnership



THE MINNESOTA P-20 EDUCATION PARTNERSHIP

The Minnesota P-20 Education Partnership is a voluntary organization made up of twenty-two statewide organizations that have responsibility for or an active interest in Minnesota's educational system from early childhood through higher education. It began in 2005 as a voluntary group named the Minnesota P-16 Education Partnership, and in 2009 it was written into law and renamed, becoming the P-20 Partnership to encompass the complete formal educational cycle. The Education Partnership works collaboratively to maximize the achievement of all students, from preschool through higher education, while also promoting the efficient use of financial and human resources. It provides a forum where critical policy issues can be collectively identified and addressed, and where data-driven decision-making structures can be developed and implemented.

During the academic years of 2007-08 and 2008-09, University of Minnesota President Robert Bruininks served as chair of the Partnership, and the U of M's College Readiness Consortium assisted him, including coordinating the Working Groups.

MEMBER ORGANIZATIONS

Education Minnesota	Minnesota Citizens League
Mentoring Partnership of Minnesota	Minnesota Council on Foundations
Minnesota Association of Charter Schools	Minnesota Department of Education
Minnesota Association of Colleges for Teacher Education	Minnesota Elementary School Principals Association
Minnesota Association for the Education of Young Children*	Minnesota Independent School Forum
Minnesota Association of School Administrators	Minnesota Minority Education Partnership, Inc.
Minnesota Association of Secondary School Principals	Minnesota Office of Higher Education
Minnesota Business Partnership Education Committee	Minnesota Parent and Teacher Association
Minnesota Career College Association	Minnesota Private College Council
Minnesota Chamber of Commerce	Minnesota School Boards Association
	Minnesota State Colleges and Universities
	University of Minnesota

*Added as a member in 2009, after the working groups completed their work

Additional information on the Minnesota P-20 Education Partnership is available at www.mnp16.org.

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of the Minnesota P-20 Partnership

2007-2009

October 2009

Dear Colleagues:

From the summer of 2007 through the summer of 2009, I had the pleasure of chairing Minnesota's P-20 Education Partnership, and this report summarizes the conclusions of three working groups the Partnership convened during that time. Nearly one hundred men and women from across Minnesota gave their time and ideas to those groups, and I would like to thank each of them and their able co-chairs for jobs exceedingly well done.

Collaborative processes like the ones that produced these reports are indispensable but also, of course, insufficient. As someone who has participated in more than a few working groups whose final reports have gathered dust on a shelf, I know the perils of collaboration that never moves to action. That said, I have also experienced the extraordinary things that happen when an idea that first emerged in reports such as these takes hold in the mind of an individual or in the life of an organization. The idea becomes a snowball gathering momentum down a hill and sometimes the world is never quite the same. As the chairmanship of the P-20 Partnership rotates to Commissioner of Education Alice Seagren this fall, I am committed to work with her and with the other members of the organization to bring some of the best ideas outlined in these reports to life.

During my own two years as chair of the Partnership, I was repeatedly struck by the common vision that is emerging across our organizations and our state. It is a vision that sets high expectations for every student, that continually invests and reinvests in human capital and that looks toward a day when the gaping gaps in achievement that divide our student groups have closed. It is a vision in which every young person is seen as "college material," and in which our systems are so carefully aligned that even amidst a dizzying array of educational choices, it is very difficult for students to make bad educational decisions.

I hope the ideas outlined in these reports will help to make our emerging common vision a bit clearer, and in the process will move Minnesota a bit further along the road to realizing it.

Sincerely,



Robert H. Bruininks
President
University of Minnesota

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The full versions of the working group reports can be found at www.mnp16.org

NOTE

In addition to the work of these three groups, the P-20 Partnership also made important progress over the past two years on another major priority – the creation of a longitudinal data system that will enable educators, policy makers and other stakeholders to monitor and improve student progress from early childhood through postsecondary education. Legislative authority to share data between the Minnesota Department of Education and the Minnesota Office of Higher Education was signed into law in 2008, and recent progress has also been made on the development of the governing body that will oversee the system, where the data will be housed, and the protections for data privacy and integrity that need to be put in place.

The creation of this longitudinal system will continue to be a major priority for the P-20 Partnership and its members in the years ahead. Without it, we are frankly flying blind in our efforts to measure and improve the progression of our students from one level of the educational system to another. With it, improvement efforts like those that the P-20 Partnership working groups undertook over the past two years, will be even better informed and more likely to succeed.





REPORT OF THE POSTSECONDARY AND WORKFORCE READINESS WORKING GROUP

CHARGE TO THE WORKING GROUP

The Postsecondary and Workforce Readiness Working Group should develop a clear and concise definition of readiness for postsecondary education and high-skill, high-wage employment in Minnesota and a plan to disseminate that definition across the state. This definition of readiness should identify the academic content knowledge and the habits of mind that students need not only to gain admission to a postsecondary institution or to secure high-skill employment, but to succeed once they are in college or on the job. Minnesota's readiness definition should be designed to provide the state's diverse students, families, educators and communities with understandable and actionable information that can be used to guide preparation for life after high school. It should promote both individual student success and systemic change across schools, districts and the state as a whole.

CO-CHAIRS

- Laura Bloomberg, Associate Director, Center for School Change, University of Minnesota
- Cynthia Crist, System Director for P-16 Collaboration, Minnesota State Colleges and Universities
- Karen Klinzing, Assistant Commissioner, Minnesota Department of Education

SUMMARY OF RECOMMENDATIONS

After a year-long exploration of postsecondary and workforce readiness, the Postsecondary and Workforce Readiness Working Group produced a final report entitled *The Road Map to College and Career Readiness for Minnesota Students*. The document includes extensive information on the knowledge, skills and habits that students need to succeed in higher education and high-skill employment in Minnesota, and the benchmarks in elementary, junior and senior high that measure progress toward that goal. The report makes recommendations in three broad areas: defining readiness, providing pathways to readiness and measuring readiness. Those recommendations are summarized below.

DEFINING READINESS

1. Endorse a Concise Definition: The Minnesota P-20 Partnership should adopt the following broad definition of college and career readiness as proposed by Achieve, Inc. The Partnership and its member organizations should also routinely reinforce the belief that the same level of readiness is needed for students wishing to pursue virtually any postsecondary education opportunity (degree, diploma, and certificate programs offered by two-year and four-year colleges and universities):
 Postsecondary and Workforce Readiness includes the knowledge and skills that high school graduates need in order to do credit bearing coursework at a [two-or four-year] college or university and/or to embark successfully on a career-track employment position (that pays a living wage, provides benefits, and offers clear pathways for advancement through further education and training).
Achieve, Inc, Ready or Not: Creating a High School Diploma that Counts, 2004
2. Endorse a Detailed Definition: The P-20 Partnership should also endorse the more detailed definition of readiness that is summarized in the "Are You Ready for College and a Career?" section of *The Road Map to College and Career Readiness Report*, which outlines the academic and workplace skills, personal and social skills, and college and career knowledge that students should possess by the time they graduate from high school.
3. Disseminate the Definitions: The P-20 Partnership should make the information contained in the "Are You Ready for College and a Career?" section of *The Road Map* report available to students, parents, educators, employers, and other interested parties in a variety of languages, print and on-line forms, and distribute it widely.

ENSURING PATHWAYS TO READINESS

4. **Promote Faculty Collaboration:** The P-20 Partnership should develop and invest in opportunities for faculty across all levels from early childhood through graduate education to work together to develop and implement strategies that will help students achieve the college and career readiness standards articulated in the “Are You Ready for College and a Career?” section of *The Road Map* report and related documents.
5. **Identify and disseminate college and career-ready student work:** The P-20 Partnership should charge a subsequent working group to identify, collect, and disseminate student work samples that provide clear, useful examples of college and career readiness consistent with *The Road Map to College and Career Readiness*. Such an effort to collect and review student work would provide educators with an excellent opportunity for increased collaboration across secondary and postsecondary lines.
6. **Fund Pilot Projects:** The P-20 Partnership should fund small-scale and locally-developed pilot projects or replication initiatives to identify and implement best practices for getting students back on the pathway to college and career success. The working group strongly recommends that these pilot initiatives be required to include collaboration between P-12 and postsecondary educators at the local level. The pilot projects should also include, or be connected to, a process for disseminating information about what works in order to foster implementation of best practices that emerge from the pilot or replication initiatives.
7. **Align Systems and Supports:** To ensure all Minnesota students are on the pathway to success, the working group also recommends that the P-20 Partnership encourage schools, districts, postsecondary institutions and other educational providers take the following steps:
 - Ensure that all Minnesota students develop a college and career attainment plan in consultation with a mentor, counselor, or adviser to guide course taking and planning throughout high school. This plan should begin no later than ninth grade and preferably much earlier.
 - Provide a diversity of pathway options for students to get a jump start on postsecondary study and workforce preparation (e.g., tech prep, postsecondary enrollment options).
 - Set and clearly define high expectations for all students, especially low-income and first-generation college students, as well as Minnesota’s increasingly diverse student population.
 - Redesign P-12 curriculum for all students to be rigorous and relevant to a postsecondary and workforce benchmark level
 - Ensure that every student knows what it means to be ready for postsecondary success and is given multiple opportunities to be college and career ready.
 - Ensure that rigorous curriculum for all students is accompanied by tailored high school academic support programs and bridge programs between high school and college.
 - Support and expand existing college and career ready informational resources for parents, students, schools, etc.
 - Provide all students and their families with the financial information and related counseling they need to ensure that postsecondary training and education is within their reach.
 - Recognize that pathways outside of course taking can be a legitimate part of a student’s pathway to college and career success.

MEASURING READINESS

8. **Use current tests to measure readiness:** In the short term, the P-20 Partnership and its member organizations should encourage and fund the use of college and career readiness assessment tools currently available in Minnesota, including the assessments in the Educational Planning and Assessment System (EXPLORE, PLAN, and ACT); Accuplacer; and eventually the Minnesota Comprehensive Assessments (once revised to reflect postsecondary readiness).
9. **Affirm benchmark readiness scores:** The P-20 Partnership and its member organizations should affirm and disseminate the non-binding college and career readiness benchmark scores derived from these assessments. The working group notes that this assessment information has value to students and parents only when the information is coupled with appropriate academic planning, guidance and support.
10. **Build a data warehouse:** In the long-term, the P-20 Partnership should spearhead the development of an interactive and searchable data warehouse so users can assess their “probability range” for college and career success based on a composite measure of data elements. This interactive warehouse would include secure access to student-specific data, a public demonstration site, and a link to user-friendly information about pathways to postsecondary readiness. Data elements would include, at a minimum, assessment scores, course-taking and school attendance.

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REPORT OF THE POSTSECONDARY AND WORKFORCE SCIENCE READINESS WORKING GROUP

CHARGE TO THE WORKING GROUP:

The Science Standards Working Group should develop broad recommendations for strengthening and enhancing Minnesota's K-12 academic standards in science. The working group should seek to promote alignment between Minnesota's K-12 science standards and: (a) the science readiness expectations of postsecondary institutions in Minnesota and around the country, and (b) recognized national and international science education frameworks.

CO-CHAIRS

- Beth Aune, Director, Division of Academic Standards and High School Improvement, Minnesota Department of Education
- Janet Dubinsky, Professor of Neuroscience, University of Minnesota

In response to its charge, the Postsecondary and Workforce Science Readiness Working Group examined overall standards issues and those involving the four major science strands included in international, national and state standards. The working group's final report makes the following recommendations for aligning Minnesota's K-12 academic standards in science with the requirements expected for success in postsecondary education and entry into the workforce of today:

1. **Decrease the Number:** Reduce the number of standards to develop a deep understanding of the essential and relatively few "big ideas" of science.
2. **Keep the Benchmarks Flexible:** Structure benchmarks that are specific enough to provide adequate guidance for state-wide assessment, yet flexible enough to allow teachers to design instruction in a variety of appropriate contexts. This would enable teachers to design instruction to take advantage of their expertise, the local environment and the interests and needs of their student.
3. **Focus on Conceptual Understanding:** Change the current topic focus of the standards to one that concentrates on concepts to provide greater depth of understanding, which prepares students for further learning.
4. **Prioritize Higher-order Skills:** Emphasize critical thinking, problem solving, quantitative reasoning, observation and design.
5. **Create Connections:** Address connections between and among science disciplines and between science and technology, engineering and mathematics.
6. **Emphasize Inquiry:** Use the process of scientific inquiry along with facts, models and theories to instill an understanding of the natural and the designed world.
7. **Enhance Relevance:** Emphasize the relevance of science to students' personal experience, including how to creatively apply scientific principles to technological design.
8. **Be Realistic and Practical:** Design standards in such a way that they are relevant, implementable and assessable.
9. **Change a Key Benchmark:** Revise the 2004 benchmark on scientific and technological innovations to better reflect the process of science by inserting "support and refine" so that the benchmark reads:
The student will be able to explain how scientific and technological innovations as well as new evidence can support, refine and challenge portions or entire accepted theories and models including but not limited to cell theory, atomic theory, theory of evolution, plate tectonic theory, germ theory of disease and big bang theory.
10. **Provide Professional Development:** Support the teaching of science standards through high-quality professional development for teachers and administrators that includes the standards for professional development outlined in the National Science Education Standards.
11. **Develop Frameworks:** Develop a curriculum frameworks document to support the implementation of the science standards.
12. **Inform Instruction:** Structure the substance and reporting of the state science assessments in such a way that they provide timely and useful information that can guide instructional improvement.
13. **Develop Better Definitions:** Urge Minnesota postsecondary institutions and the business community to develop an explicit set of science criteria/competencies for students entering their institutions.
14. **Make Time for Science in Elementary Schools:** With the current emphasis in elementary schools on reading and math, science is frequently not taught at all or on an irregular basis. Yet, it is in the early elementary years that students frequently form long-held opinions of science. Science needs to be treated as a core subject, and as such, schools need to provide students with direct, active engagement with science on a regular basis.

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REPORT OF THE SCIENCE INSTRUCTION WORKING GROUP

CHARGE OF THE WORKING GROUP

The Science Instruction Working Group should identify policies and practices that will increase the capacity of teachers, principals, mentors and other adults to help students from all backgrounds meet and exceed state academic standards in science and develop a lifelong interest in science and related fields. In particular, the group should work to identify instructional best practices in elementary and secondary science education that can be disseminated through the state of Minnesota's new Math and Science Academies and other professional development initiatives.

CO-CHAIRS

- Liesl Chatman, Director of Professional Development, Science Museum of Minnesota
- Steve Kelley, Director and Senior Fellow, Center for Science, Technology and Public Policy, Humphrey Institute of Public Affairs, University of Minnesota
- Judith Ramaley, President, Winona State University

SUMMARY OF RECOMMENDATIONS

The Instruction Group worked together over one year to identify improved instructional practices in elementary and secondary science, technology, engineering and mathematics (STEM) education that can be adopted by education stakeholders and disseminated through the state of Minnesota's new Math and Science Academies and other initiatives. Since Minnesota's new science standards include engineering and technology literacy, the Instruction Group concluded that its recommendations should address science, technology, engineering and mathematics (STEM) instruction as a whole. Those recommendations are:

1. **Create and Fund the Position of STEM Liaison:** The position of STEM Liaison should be created and funded by the state of Minnesota to work in a single district or in groups of districts depending on the number of students. STEM Liaisons would be individuals who are knowledgeable in one or more STEM subjects and who will be responsible for connecting teachers and students to STEM resources in the community and for encouraging schools and community organizations to promote the spirit of STEM in the broader community. They also would assist teachers in obtaining effective professional development and materials for inquiry-based teaching. STEM Liaisons would encourage community support for out-of-school learning opportunities and STEM competitions that engage students.
2. **Create a STEM Advisory Council:** A STEM Advisory Council should be created and should operate under the Minnesota Department of Education. The Council should develop criteria for effective STEM curricula and should recommend, based on that criteria, curricula that could be chosen by school districts. The Council should also oversee the development and implementation of STEM teaching frameworks based on the state's STEM standards. In addition, the Council should supervise the development of multiple assessments designed to improve STEM learning. Members of the Council must be teachers and researchers with a high level of expertise in STEM education in elementary through postsecondary settings.
3. **Support Effective Curricula:** State-recommended curricula chosen by the STEM Advisory Council should be supported by the state. The curricula should implement inquiry-based learning with significant hands-on learning components and should be focused on mastery of core STEM concepts and skills which are supported by frameworks that connect academic standards with classrooms and community learning opportunities. Districts should not be required to adopt the recommended curricula, but districts that choose to implement a curriculum recommended by the Council should receive state support for purchasing the curriculum and related materials and for professional development for all district staff and teachers responsible for implementing the curriculum.
4. **Continue STEM Academies:** Mathematics and science teacher academies have already been funded by the state to improve professional development in STEM subjects. Funding for the Academies should be continued and they should become the vehicle for providing support and training in the STEM curricula that are selected by the STEM Advisory Council. The state should also consider giving the STEM Academies responsibility for and capacity to handle the support for physical materials used in the curricula similar to the support provided currently by the Science Museum of Minnesota for some STEM curricula.

5. **Expand Informal Learning:** The existing system of science museums and other informal learning centers and opportunities should be expanded throughout Minnesota with new distributed STEM learning centers, mobile learning laboratories and enhanced environmental learning centers.
6. **Create a STEM Culture:** The P-20 Partnership should work to inspire the spirit of STEM by connecting STEM education activities from PreK-12 through postsecondary education and community activities, creating a culture of STEM learning in students, schools, families and communities. Minnesota should use a broad range of tools to convey to students, parents, teachers and the community that the state values STEM learning and STEM fields.
7. **Align Curriculum:** Minnesota's PreK-12 to postsecondary STEM curriculum should be focused on mastery of core STEM concepts and skills and frameworks that connect academic standards with classrooms and community learning opportunities should be developed. Minnesota STEM standards and curriculum must be benchmarked to international standards, and exemplary STEM schools should be recognized.
8. **Promote Best Practice Instruction:** The P-20 Partnership should work to identify and adopt effective, evidence-based instructional practices that engage students and teachers in inquiry-based learning and investigation and integrate STEM subjects with other parts of the curriculum. Science and engineering should be regularly taught in such a way that students acquire a meaningful understanding of science and design/engineering in a coherent sequence in elementary school. In secondary school, Minnesota should identify a smaller number of key standards so that students can acquire a deeper understanding of the subject matter and so that there will be enough time for teachers to incorporate project-based programs that inspire students to explore further inquiry. Funding should be made available to permit teachers and students real-life experience in the application of STEM knowledge and skills.
9. **Strengthen Teacher Preparation and Professional Development:** Teacher preparation programs should adopt teaching and learning methods for initial preparation and professional development of teachers that develop reflective practitioners who continue to improve their knowledge and skills. The state should support and encourage science induction programs and make more time available for teachers to work together. The Minnesota Math and Science Teacher Academies should be utilized to promote STEM learning across the state. Further, the Academies' current emphasis on middle school should be expanded to include elementary science instruction. STEM liaisons should assist schools in finding appropriate professional development programs.
10. **Conduct Effective Assessments:** The state should identify and adopt methods of assessment that effectively support student learning and continuous improvement of STEM instruction. Minnesota should recognize the message that assessments send to our students and apply the principles of effective assessment to the evaluation of learning in Minnesota schools. The Instruction Group recommends training and support for instruction that engages students in STEM topics and inspires students to explore STEM in multiple environments. In order to support this recommendation, a student's knowledge and skills must be assessed using multiple tools.
11. **Provide Quality Science Learning Environments:** Minnesota should work to ensure that all students have access to quality school-based (formal) and out-of-school (informal) STEM learning environments that exemplify the value that Minnesota places upon science, technology, engineering and mathematics education. It is particularly important to expand students' learning in the STEM fields beyond the classroom to incorporate after school and out of school programs. STEM Liaisons should coordinate classes and informal learning programs. But while the state should expand learning opportunities outside of schools, it is also critical to ensure that classrooms have basic supplies for their students. Elementary schools should be equipped with the materials and spaces that support inquiry and the doing of science and engineering. Secondary classrooms should be equipped with technologically current laboratory equipment and supplies to create an appropriate STEM learning environment for all students.
12. **Close Achievement Gaps in STEM:** The P-20 Partnership should work to develop a strategy for closing the large achievement gaps in the STEM disciplines that exist among student groups in Minnesota. This strategy should include ways to help teachers acquire the capacity during their professional preparation and through ongoing professional development to engage all of their students in STEM learning by applying culturally competent pedagogies and using culturally relevant materials and curriculum. Quantitative goals should be set and tracked, reducing Minnesota's ethnic achievement gap. The state and local businesses should support opportunities for students and community mentors and advisers to participate in STEM programs such as GEMS that encourage girls to pursue STEM careers. The state should also encourage the creation of Environmental Learning Centers to incorporate more STEM topics in their informal learning environments and to create more access for rural Minnesotans to informal STEM learning opportunities.

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