



OPAS Summit 2005 Report of Summit Findings

Executive Summary

Preface

A two-day Strategic Planning Summit was held in Portland, Oregon on September 15 and 16, 2005. The Summit brought together leaders from throughout the state to share information and insights and begin to craft a strategy for enhancing pre-engineering and applied science education. The delegates at the Summit developed a set of recommendations that will be used by a follow-up task force to craft a cohesive strategy statement. In addition, a set of subcommittees and task forces will develop implementation plans and follow through on these plans.

This report describes the goals and themes of the summit, the vision and mission of the summit delegates, and the recommendations developed by these delegates. In addition, it outlines steps that will be used to assure the maximum impact of the summit.

Goals of the Summit

- Consider all grade levels from kindergarten through the first two years of college;
- Set measurable goals including those that address increasing the motivation and academic preparedness of students who are pursuing or might pursue engineering or technology careers;
- Improve coordination and cooperation among organizations;
- Make better use of limited resources;
- Identify ways of recruiting more resources and more effectively competing for these resources;
- Promote efficient and seamless transfer of credit among education sectors;
- Provide input to the Engineering & Technology Industry Council (ETIC) including criteria for possible future funding of pre-engineering and pre-college grants; and
- Complement the work of the State Board of Education and the State Board of Higher Education and its Excellence in Delivery and Productivity Workgroup.

Keynotes, Vision, Mission, Goals

Each day began with a keynote presentation. The first day, Cary Sneider, Vice President for Educator Programs from the Museum of Science in Boston, spoke to the group about supporting engineering education for all students as an essential literacy in a modern democracy. On the second day, Steve Pawlowski, Senior Fellow and CTO from Intel Corporation spoke about the challenges of recruiting engineers and the lack of engineering recruits from within Oregon.

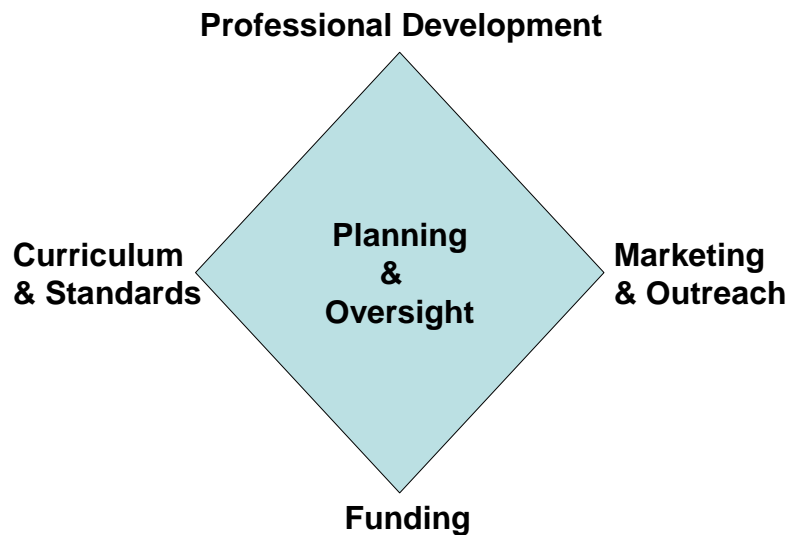
A draft vision and goals statement was presented and delegates were asked to comment on the statement. Delegates wanted to see more explicit connections with industry, such as active

industry partnerships to provide careers, and industry input into curriculum. Other concerns included the learning environment and non-traditional students. Some groups thought motivation should be emphasized, including recognition of the role of informal science education and recognition of social supports that are needed.

Suggested changes included some re-writing of vision elements, some additional goals, and some suggested reconfiguration of the framework and format. Some comments focused on the educational process. Others emphasized flexibility and transferability in the educational pathway.

Theme Discussions

Delegates discussed the five overarching themes for the conference – motivation, preparation, transfer, retention, and diversity – identifying what was working in each area and what was needed. One insight gained from this activity was that some of the things identified as working well were the very things that were needed — in greater quantity, with broader geographic reach, and providing opportunities for more students to participate.



Focus Area Discussions and Recommendations

Delegates chose one focus area in which to work and spent a significant amount of time at the summit developing goals and strategies for this focus area. Initially, they discussed the current situation and status. Then, they developed key goals. From the goals, they identified possible strategies. Finally, they chose one or more priority strategies and developed action plans for each strategy. As shown in the diagram above and the table on page 6, the groups' recommendations generally fell in five general categories:

- Establish **strategic and tactical councils, committees, and task forces** to further develop Summit recommendations and coordinate their implementation

- Initiate and enhance **marketing and outreach efforts** to assure that all students and their parents understand the opportunities available to them and the steps required to reach them
- Enhance **curriculum and standards** to include engineering & technology to achieve several overlapping goals: enhance problem solving skills of all students; motivate students in traditional disciplines including math and science; provide technical literacy to all students; and impart insights on wide variety of career opportunities and possible pathways to these careers.
- Grow and enhance **professional development** programs that allow K12 and college faculty to more effectively deliver STEM¹ curricula and assure consistency between the outcomes of courses and the prerequisites of subsequent courses.
- Enhance **funding** to achieve these goals from federal, state, and private sources through collaboration among stake holders.

Alignment and Coordination: System-wide

The primary strategy from this group was to create a statewide council that has both strategic and tactical levels. This council would be tasked to develop policy recommendations, and coordinate existing and new engineering and applied science programs. A supporting strategy was to immediately restart and expand a dormant “Engineered Community” group to take on skill set development, career pathways, and other recommendations of the Summit. This latter group may become the tactical level of the statewide council once the council is up and running.

Alignment and Coordination: Curricula and Co-Curricula

The key strategy of this group was to improve coordination and funding of co-curricular activities in order to assure that all students in Oregon have the opportunity to participate in co-curricular activities.

Career Pathways

The three priority strategies that emerged from this group were to create a customizable pathway framework (building on existing efforts), create strategic multi-faceted marketing of the common framework, and assess and evaluate the framework model.

Diversity

In order to raise the participation and performance of under-represented groups at all levels, this group’s priority strategy was work through parents, providing them the information and insights required to overcome cultural barriers to engineering and related careers.

Instructional Professional Development

The three priority strategies in this focus area were to develop pooled resources for teaching engineering and applied science projects, elucidate the role of engineering in supporting core curriculum, and improve the relevance and quality of teaching at the post-secondary level.

¹ Science Technology Engineering & Mathematics

Marketing Engineering & Applied Science Careers

The overarching goal is to assure that every student entering high school has been exposed to engineering and has the resources available to make an informed choice about STEM² educational opportunities. The group identified three priority strategies: Create a multi-tiered program to build awareness of opportunities and career options, leverage and/or replicate existing models and best practices, and enhance state/industry/education/association partnerships.

Standards, Courses and Curricula

The two priority strategies were to develop standard outcomes and pre-requisite knowledge and skills for core 100-200 level engineering science; and develop assessments based on standard outcomes and rubrics.

Student Success: Access, Motivation and Retention

The two priority strategies were to form a stakeholder team to rethink standards and develop a problem solving, inquiry-based model; and create a statewide council for resource coordination and planning.

² Science, Technology, Engineering and Mathematics.

Next Steps

Many of the recommendations developed by the Summit delegates will require follow-up work by committees and task forces. Since the Summit was held, a survey of the delegates has been conducted to assess the level and types of interest in follow-up activities. 60% of the delegates responded to the survey. Of those that responded, 82% said they wanted to participate in follow-up committees or task forces. These delegates and others will be contacted regarding such follow-up as described below.

To maximize the impact of the Summit and its recommendations there will be two major types of follow-up:

- (1) We will form a Strategic Planning Task Force to integrate the recommendations from the Summit into a cohesive strategy statement. This Task Force will also develop a communications plan for this strategy statement including a list of organizations that should be informed about the strategy and a timeline for these communications. We expect these organizations to include relevant councils, boards, and committees that should be informed about the strategy, such as the Oregon state boards of Education and Higher Education, Engineering & Technology Industry Council, Oregon Business Plan Steering Committee and relevant legislative committees.
- (2) We will form a set of subcommittees or task forces that will
 - a. Refine the recommendations developed at the Summit.
 - b. Develop implementation plans.
 - c. Identify and recruit resources required for these plans.
 - d. Oversee the actual implementation of these plans.

The Summit recommendations will also be used as

- a source of criteria for requests for proposals by ETIC and other organizations; and
- a starting point for proposals to federal agencies and other sources of funding.

A post-summit review meeting will be held in approximately six months to compare the results of the summit to its goals and consider scheduling a second annual summit or other appropriate planning events.

Complete Report

The complete OPAS Summit Report is available at opas.ous.edu/report.htm

Focus Area	Follow-up Organization	Marketing / Outreach	Curriculum / Standards	Professional Development	Funding
Alignment & Coordination: System-wide	Create Strategic & Tactical Councils	Review recommendations, advocate & coordinate	Review recommendations, advocate & coordinate	Review recommendations, advocate & coordinate	Review recommendations, advocate & coordinate
Alignment & Coordination: Curricula and Co-curricula	Summit of teachers & administrators	Make co-curricular programs available to all students	Share among organizations		Jointly explore
Career Pathways	Create Statewide Engineering Pathways Task Force	Inform all stakeholders	Create customizable pathway framework		
Diversity	Champions that promote strategy	Work through parents educating them on opportunities & pathways.		Use internships and industry mentors	
Instructional Professional Development	Coordinate development and implementation of recommendations		Pool resources including project kits, elucidate of engineering in teaching science & math. Improve relevance of college teaching	Deliver presentations to teachers via teacher associations. Use industry / university / community college partnership	
Marketing Engineering & Applied Science Careers	OPAS Committee or other follow-up organization	Multi-tiered awareness program, grow existing programs, enhance partnerships. Grow outreach programs, e.g. ORTOP, ISEF. Establish industry speakers & mentor.		Short-term teacher training, e.g. SuperQuest. Develop Teacher internships	Seek industry funding
Standards, Courses and Curricula	Advisory Committee of academic and industry.		Standardize pre-requisites & outcomes of lower division courses and develop assessments.	Focus on course outcomes.	
Students Success: Access, Motivation and Retention	Statewide Council for resource coordination and planning		Enhanced science/math standards to assure both inquiry and problem solving models are included.		

Summary of Recommendations