

## Appendix B: Themes Discussion—What's Working

### Preparation

- Top/ best students are globally competitive (e.g. science fairs/ competitions)
- Where industry collaborations exist they work (internships, co-op programs, etc.)
- Industry collaborations where they exist (ex. Zoom into Engineering, Saturday Academy/ ASE internships, co-ops) are working
- In combination with community college the right math/ science courses are available
- Growing effort to address instruction at university level
- Transfer from community college to university
- Collaboration between high school and community college teachers and impact on curriculum
- Best students are globally competitive
- Right math/ science courses are available
- Parents (especially of immigrants) are motivating students to continue and succeed
- Growing collaboration between high school and community college teachers around instruction and curriculum
- Access to early planning and counseling in some schools

### Diversity

- Targeted associations
- Recruitment efforts
- Strong Entry level community college system for transfer to 4 year Engineering
- Relevant role models – gender, ethnicity, cultural
- A few role models available in each field
- Engaging middle school students
- Student centered recruiting
- Targeted scholarships
- Awareness of the need
- Existing organizations, programs
  - SWE
  - WITI
  - AWSEM
  - MESA
  - SMILE
- Female retention rate pretty good (NSF study).
- Hands on program help with UREM (URM?) students

### Motivation

- Contests
- Small class size
- Professional development for teachers
- Younger role models – near peer
- Greater in school, out of school connections

- “Girls only” classes
- Software industry working with teachers for professional development
- Toys
- Hands-on
- Relevant to real life
- Apprenticeships/ internship choices
- Parental involvement
- Industry in the classroom
- Field trips
- Intense immersion – in-depth, week long
- Science Olympics (sp?), ISEF, ORTOP – FIRST Lego Robotics, early ages, Superquest – Software Association Oregon
- Competition and Events – University involvement, recognition
- Outreach – Academic, Corporate – MESA, mentoring
- Star Trek – Media, CSI, etc.
- Support/ Relationships - teachers, clubs, mentors
- NSF Cascading Mentor Programs

### **Retention**

- Prior preparation
- Motivation
- Relevance
- Hands-on (experiential) learning
- Students seeing their successes
- Career and academic preparation
- Cohort and relationships
- Small classes
- Multiple teaching methods
- Support in freshman year
- Early engineering experience
- Early access to transitional opportunities
- Student competitions
- Sample engineering experiences, internships
- Membership in professional society
- Purdue program, EPICS
  - Service learning
  - Connections to community

### **Transfer**

- Transfer agreements
- Common course numbers
- Collaboration between institutions
- Course by course outcome agreements
- 2+2, dual credits
- Pavtec

- Dual Enrollment Programs community colleges and University
- College Now
- HS to CC/University
- CC /University articulation agreements –where they exist
- Distance education
- Distance education working to alleviate problems with cultural transition
- Cooperative work experience
- Job placement