

**Engineering and Technology Industry Council  
Campus Investment Proposal  
Biennium from July 1, 2007 to June 30, 2009**

**Campus:** Saturday Academy

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**Summary of Proposal:** Offer high school students ASE apprenticeships in small to medium sized technology and engineering companies and in 5-student cohorts at university computer science departments, increasing stipend payments to make these positions more attractive.

**Vision Statement**

Saturday Academy's vision is to facilitate the exploration of computer science and engineering careers by highly able high school students through the expansion of our proven internship program into the world of small to medium sized technology-related businesses and through cohort-based learning in university computer science departments.

**Aspirational Peers**

To our knowledge there are no other competitive high school internship programs in the country that focus on engineering and computer science.

**Long-term Goals**

By offering young people in-depth, career exploration of the highest quality, Saturday Academy's goal is to help shape their career and educational decisions in ways that lead them to choose professions that are personally rewarding and contributive to the greater community and Oregon's economy. Recent analysis of Oregon's economy indicates that large scale technology-based companies likely will play a less significant role in Oregon's future than was true in the past, and that smaller locally-based companies are likely to be the cornerstone our state's future economic growth. Saturday Academy, through its apprenticeship program, seeks to help the state make and sustain this transition.

**Investment Description**

Since 1990, Saturday Academy has arranged summer internships for high achieving high school students through its Apprenticeships in Science and Engineering program (ASE). Historically, we have seen that young people do not apply for computer science and engineering apprenticeships at anywhere near the rate that they do for biomedical positions. The applicant rates in each category have stayed steady regardless of the number of positions available in each

discipline, which suggests that the higher applicant rate in biomedical fields does not reflect a scarcity of biomedical compared to engineering and computer science positions. Below is data for 2002-06:

Field	# of pos'ns	# app'nts per pos'n
Biomedical	19 - 24	12 – 15
Engineering	27 - 45	6 – 8
Computer Science	26 - 34	3 – 5

Studies show that young people feel computer science careers are isolating, have poorly articulated connections to the real world and lack job security. Many do not have even a basic understanding of engineering, or what an engineer does. These are the realities facing the industry as multi-talented young people choose other career paths that appear more attractive and familiar.

Saturday Academy proposes two investments to address these challenges.

Investment #1: Small to medium companies. Saturday Academy has historically offered most computer science and engineering apprenticeships in large local companies, such as Intel, IBM, Tektronix and Mentor Graphics. In 2006, 18 of 25 computer science positions will be at large companies (over 100 employees); 22 of 26 engineering positions will take place at large companies. Both because of the above mentioned structural changes in the Oregon economy, and because we feel the educational opportunities may be broader in smaller companies, this proposal seeks to **expand our apprenticeship offerings into the small to medium sized companies.** We anticipate that the smaller settings will expose students more directly to real world computer science applications and engineering challenges, as well as to cutting edge product development. Such high impact experiences are essential to engaging idealistic young people who want to change the world. These firms also are more likely to help students develop a wider range of skills, as smaller staffs require everyone to pitch in and multi-task. Having a wider range of skills should make students feel more secure about their ability to navigate the ever-changing job environment. Finally, students are more likely to gain exposure to important business principles and strategic decision-making in the small company. Some of them will use these experiences to build their own start-ups someday. We believe more young people will be interested in computer science and engineering apprenticeships and, ultimately, technical careers if we can offer them this “soup to nuts” type of experience. From the business’ point of view, ETIC’s investment will allow them to bring on an employee who, while certainly needing training up front, will produce real work product by the end of the summer and, in the best of circumstances, will move onto the company’s payroll or create a small business of their own in the future.

Investment #2: Computer science research. Because research is essential to developing the new ideas that will create the small companies of the future, we also seek to **place four cohorts of 5 students each at Oregon university computer science departments in summer 3008 and 2009.** Many students do not have an understanding of the role of research in the development of the field, nor of the day-to-day work of a computer science researcher. Our cohort program will allow 20 students a year to work in 4 team environments. Each cohort will work with graduate

student mentors and supervising professors. The cohort will not only provide a support network for the young computer scientists; it will also facilitate collaborative thinking about the research project, which will result in better solutions to difficult problems. This is especially likely where research revolves around consumer products, as young people already live at the cutting edge of such technology and have much to offer in this regard. Participating in such research is the ultimate “real world” experience for a young person. If we want them to choose computer science, we will need to offer nothing less than this. From the faculty’s point of view, ideally once they are introduced to the program, and work with these talented local students, they will understand that they can help build the pipeline *and* conduct cutting edge research.

Methodology. First, we propose using market forces to attract students to these apprenticeships. Currently most apprentices are paid \$1000 for their summer stipend (8 weeks full time). By doubling the stipend, we will use the power of the market to help us recruit talented young people who might otherwise make different career choices without ever trying computer science.

Second, we will use our experience in Saturday Academy’s retail Classes program to develop more intriguing job descriptions that capture young people’s imagination. Historically, we have followed the lead of the engineers and computer scientists in describing the available jobs, resulting in highly technical job descriptions. We will work more extensively with them to articulate the real world applications of the positions, in order to give students a better feel for why this work is important. We will involve our Catalog writers, who have 23 years experience in writing copy that is highly effective in capturing the attention of young people.

Third, we will employ a student recruiter who will interface with teachers and students to discover the talented young people in the community who are today going undiscovered.

Fourth, we will mine the Saturday Academy data base to identify and recruit students who have shown an interest in technical careers, based on the classes they have taken.

Fifth, we will offer tuition waivers to encourage young women and minorities to participate in Saturday Academy classes that will prepare them for these technical apprenticeships.

Sixth, we will collaborate with the Oregon Pre-engineering and Applied Sciences marketing subcommittee in its efforts to educate young people about computer science and technical careers.

Finally, we will collaborate with professional societies, such as the Software Association of Oregon, to educate their membership about the importance of building the pipeline and to identify companies that are willing and able to participate.

### **Results and Benefits**

Our goal in year one of the biennium is to offer 30 computer science and/or engineering apprenticeships in small-to-medium firms (vs. 15 in 2005 and 11 in 2006), and 46 in year two. At the universities, we will seek 20 placements each summer, for a total of 40 over the biennium. A total of 116 students will have in-depth experiences with computer science professionals through this project.

This project will allow us to seed participation in ASE by small to medium size companies that do not currently invest with us. Ideally, a significant percentage of these employers will conclude that it is socially desirable as well as beneficial to their companies to continue doing this pipeline work in the future. We routinely see mentor return rates of 74%, and would expect that ratio to hold for this project as well, as long as ETIC funding continues (this biennium). When the funding expires, we hope to retain at least half of these new companies and, through their advocacy to their peers, continue to add new small companies.

In addition to increasing the participation rate of small companies, this will represent a significant expansion of private industry participation in ASE overall. In 2006, 31 apprenticeships will be in private industry; 84 will be at government agencies and universities. Year one of this proposal would almost double the 2006 participation by small businesses. By expanding industry participation in ASE, we realize the public-private partnership that is at the heart of ETIC. In addition, each of these participating companies that goes on to support ASE students in the future will help ETIC realize its required match obligations.

Most importantly, by the end of this biennium we will have given 116 young people hands-on experiences in a field they may never have dreamed was right for them. We will institute follow-up tracking of this first group of students, and will report during the '09-11 biennium on their choices of majors in college and their perceptions of the value of their ASE experience. We anticipate that overwhelmingly they will report their ASE experience was highly influential in their development as young professionals, and that at least 75% will still be working in the field of computer science.

**Proposed Investment and Private Support Forecast (\$M)**

Saturday Academy’s ASE program will raise approximately \$200,000 per year from private companies and foundations, and \$100,000 per year from other governmental entities, for a total of \$600,000 over the biennium. Saturday Academy as a whole raises approximately \$1.5 million annually from all sources, which efforts will continue in the normal course. For this project, we anticipate raising \$40,000 from participating companies and grant-funded research programs at universities.

		<b>2007-2009 Biennium</b>
1		
2	<b>Proposed State investment (\$M)</b>	
3	<b>Existing programs</b>	0
4	<b>New Programs</b>	.481
5	<b>Subtotal</b>	.481
6	<b>Expected private support (\$M)</b>	.040
7	<b>Total (\$M)</b>	\$ .521
8	<b>Personnel supported (FTE)</b>	
9	<b>Existing faculty</b>	0.0
10	<b>New faculty</b>	0.0
11	<b>Existing staff</b>	0.00
12	<b>New staff</b>	1.40
13	<b>Total</b>	1.40
14	<b>Uses of proposed investment</b>	
15	<b>New facilities</b>	\$
16	<b>Improvements to facilities</b>	\$
17	<b>Laboratory equipment</b>	\$
18	<b>Other equipment</b>	\$
19	<b>Other one-time expenses</b>	\$
20	<b>Existing faculty salaries &amp; benefits</b>	\$
21	<b>New faculty salaries &amp; benefits</b>	\$
22	<b>Existing staff salaries &amp; benefits</b>	\$
23	<b>New staff salaries &amp; benefits</b>	.150
24	<b>Services, supplies, student conferences</b>	.114
25	<b>Tuition waivers to CS courses</b>	.020
26	<b>Follow-up tracking of students through 2009-11 biennium</b>	.005
26	<b>Student Stipends</b>	.232
27	<b>Total</b>	.521

**Metrics Forecast (for programs/departments receiving ETIC funding):**

Because this is the first time applying this metric, we have used AY05 as the base year.

	AY05	AY06	AY07	AY08	AY09
Placements in companies of < 100 employees	15	11	15	30	46
Placements in CS research	2	5	10	20	20
Participating CS/Eng'g companies of <100 employees	14	10	14	25	36