

January 10, 2018

MEMORANDUM

TO: State Board of Regents

FROM: David L. Buhler

SUBJECT: Engineering and Computer Technology Initiative Annual Report from the Technology Initiative Advisory Board

Issue

The 2001 Legislature approved SB61: Enhancements to the State Systems of Public and Higher Education. This legislation established the Engineering and Computer Technology Initiative within the Utah System of Higher Education (USHE), with the goal to increase the number of students graduating from engineering, computer science, and related technology programs. The legislation created the Technology Initiative Advisory Board (TIAB), appointed by the Governor, that makes an annual report to the Board of Regents. The attached document provides this year's report from the TIAB.

Background

Key highlights noted in the report include:

- During the last 16 years, the Engineering and Computer Technology Initiative has been successful in increasing the number of graduates in targeted areas.
- During FY17 1,745 engineering degrees were awarded compared to 862 in 2000, and in computer science 1,481 degrees were awarded compared to 513 in 2000.
- Since the initiative began, a total of 35,628 engineering and computer science degrees have been awarded.
- The TIAB requested that FY16 be used as the base year for comparison since that was the last year data was used to justify new legislative appropriations.
- Total engineering and computer science degrees awarded in FY17 was 3,226 compared to 2,938 in FY16, representing an increase of 9.8 percent over the base year.

Policy Issues

There are no policy issues associated with this report.

Commissioner's Recommendation

This is an information item only; no action is required.

David L. Buhler
Commissioner of Higher Education

DLB/BKC
Attachment

Higher Education Appropriations Subcommittee: Engineering and Computer Technology Initiative Report *2017 Legislative Session Intent Language*

This Brief provides a status report relative to the following legislative intent language adopted in the 2017 Legislative Session:

The Legislature intends that the funds appropriated for the Engineering Initiative be allocated to institutions based on the increases in graduates from engineering, computer science, and technology degree programs since Fiscal Year 2014. The Legislature further intends that Engineering Initiative funds support undergraduate programs that meet workforce needs for the highest demand occupations. Recommendations for appropriation and follow up reporting on program success are to be reviewed by the Business, Economic Development, and Labor Appropriations Subcommittee and the Higher Education Appropriations Subcommittee.

Introduction

The 2001 Legislature approved SB61 *Enhancements to the State Systems of Public and Higher Education*, sponsored by Senator Lyle Hillyard. This legislation established the Engineering and Computer Technology Initiative within the Utah System of Higher Education (USHE) with the intent to increase the number of students graduating from engineering, computer science, and related technology programs.

Specifically, key provisions of SB61 have been addressed and include:

1. Established a goal to triple the number of graduates from USHE institutions in engineering, computer science, and related technology.
2. Directed the Regents to establish rules providing the criteria for those fields of study that qualify as “related technology.”
3. Provided supplemental funds for equipment purchases to improve the quality of instructional programs in engineering, computer science, and related technologies.
4. Established a student scholarship to encourage enrollment in programs included in the initiative.
5. Assisted USHE institutions to hire and retain qualified faculty to teach in initiative programs.
6. Increased program capacity by funding new and renovated capital facilities, and funding for new engineering and computer science programs.
7. Created the Technology Initiative Advisory Board (TIAB) to make recommendations to the Regents in its administration of the initiative. The advisory board includes individuals appointed by the Governor from business and industry who have expertise in the areas of engineering, computer science, and related technologies.
8. Provided requirement to report funding matches for faculty positions funded through initiative resources.

To date, \$19 million of on-going funding plus \$10.45M of one-time funding have been appropriated to support the initiative.

Appropriated Funds

The following table gives a summary of the funding between FY2002 and FY2018.

| Engineering and Computer Science Initiative Funding History 2002-2016 | | | |
|--|--------------------|-------------------|--------------------------|
| Year | Funds Appropriated | | |
| | Ongoing | One time | Scholarship ¹ |
| 2001-02 | 1,000,000 | 2,500,000 | 500,000 |
| 2002-03 | 2,000,000 | 1,000,000 | 0 |
| 2003-04 | 500,000 | 0 | 50,000 |
| 2004-05 | 500,000 | 500,000 | 0 |
| 2005-06 | 1,500,000 | 500,000 | 0 |
| 2006-07 | 500,000 | 700,000 | 0 |
| 2007-08 | 3,000,000 | 2,000,000 | 0 |
| 2008-09 | 0 | 250,000 | 0 |
| 2009-10 | 0 | 2,000,000 | 0 |
| 2010-11 | 0 | 0 | 0 |
| 2011-12 | 0 | 0 | 0 |
| 2012-13 | 2,500,000 | 0 | 0 |
| 2013-14 | 0 | 0 | 0 |
| 2014-15 | 0 | 0 | 0 |
| 2015-16 | 3,500,000 | 1,000,000 | 0 |
| 2016-17 | 0 | 0 | 0 |
| 2017-18 | 4,000,000 | 0 | 0 |
| Total | 19,000,000 | 10,450,000 | 550,000 |

Degree Completion Results

Although the initiative has been underway since 2001, base year comparisons measured graduation counts since 2014 for new funding provided by the 2017 Legislature. Now that funding has been provided based on the 2014 data, a new base year of FY2016 will be used. Accordingly, the chart below compares data between FY2016 and FY2017.

| Comparison of Degree Completions for the Engineering and Computer Science Initiative | | | | | | | | |
|--|--------------------|------|-------|--------|------|-------|------------------------------|----------------|
| | FY2016 (Base Year) | | | FY2017 | | | Change from FY2016 to FY2017 | |
| | CS | Eng | Total | CS | Eng | Total | Change | Percent Change |
| Total | 1312 | 1626 | 2938 | 1481 | 1745 | 3226 | 288 | 9.8 |

Over the life of the initiative, there has been a significant impact on degrees awarded in engineering and computer science. The 1,745 engineering degrees awarded in FY2017 compare to 862 awarded in FY2000 (102% increase), and the 1481 computer science degrees awarded in FY2017 compare to 513 awarded in FY2000 (189% increase). Over time there has been a consistent increase in total number of degrees awarded in the targeted areas. Since the initiative began, a total of 35,628 computer science and engineering degrees

¹ In 2001, SB61 established a loan forgiveness fund to assist students in obtaining degrees in engineering and computer science. In 2009, SB105 changed the loan forgiveness program to a scholarship program for the purpose of recruiting, retaining, and training engineering and computer science and related technology students. At that time scholarship funding was \$39,200 annually. In FY13 an additional \$300,000 of on-going scholarship funding was allocated to institutions by the Board of Regents from the FY13 \$2,500,000 appropriation. This \$300,000 of scholarship funding did not roll into the previously legislated scholarship funding program but went directly to institutions.

have been awarded. The initiative has resulted in a positive cumulative impact for the state. It is believed that this targeted investment has made a significant difference for Utah.

Allocation of Funds Appropriated by the 2017 Legislature

The Technology Initiative Advisory Board (TIAB), the industry body tasked with making recommendations to the Utah State Board of Regents, used the legislative intent language to guide its recommended allocation of funds. Specifically, the TIAB considered: 1) graduation increase since 2014 in areas targeted by the initiative, and 2) high demand occupations. The University of Utah, Utah State University and Weber State University had the most graduates since 2014 as well as the highest rates of graduation increases. Consistent with the 2017 intent language, the highest funding recommendations were made to these three institutions.

Requests from institutions exceeded the amount of available funds. To match allocations to the \$4,000,000 of available funding, the TIAB focused its recommendations on requests for new faculty only. Requests for one-time funds and requests for on-going staff positions were not considered. Faculty requests were limited to programs that prepare students for the highest demand occupations. Based on data from the Utah Department of Workforce Services and the Economic Development Corporation of Utah, the four highest demand occupations that were also part of institutional proposals included: 1) Computer Science, 2) Mechanical Engineering, 3) Electrical/Computer Engineering, and 4) Civil Engineering. The TIAB recommended that institutions use funding from this new appropriation to increase the number of faculty members in programs that currently exist within these disciplines.

Given the considerations indicated above, the TIAB provided a unanimous recommendation that funding from the 2017 Legislature be allocated and distributed to the institutions effective FY18 consistent with legislative intent language. This recommendation was accepted by the Board of Regents on July 21, 2017.

| Institution | Graduation Growth Increase from FY14 to FY16 | Percent of Total Graduation Growth | On-going Funds | Maximum Number of Positions Funding will Support with 50% Match | Number of Positions Requested by Institution |
|--|--|------------------------------------|--------------------|---|--|
| University of Utah- College of Engineering | 163 | 24.73 | \$1,540,000 | 25 | 29 |
| Utah State University | 127 | 19.27 | \$900,000 | 15 | 18 |
| Weber State University | 168 | 25.49 | \$840,000 | 14 | 16 |
| Southern Utah University | 24 | 3.64 | \$60,000 | 1 | 2 |
| Snow College | 20 | 3.04 | \$60,000 | 1 | 1 |
| Dixie State University | 5 | 0.76 | \$60,000 | 1 | 8 |
| Utah Valley University | 66 | 10.02 | \$480,000 | 8 | 10 |
| Salt Lake Community College | 86 | 13.05 | \$60,000 | 1 | 1 |
| Total | 659 | 100.00 | \$4,000,000 | 66 | 85 |

Matching Funds

Utah Code 53B-6-105.9 requires institutions to match on-going funds appropriated to the initiative that are used for faculty positions. Beginning with funding appropriated for FY2013, institutions have submitted reports that demonstrate compliance with the matching requirement. Based on information from these reports, the on-going appropriations awarded in FY2013 and FY2016 were matched by the USHE institutions. Institutions have also identified the matching funds for the most recent appropriation of \$4 million that became available in the current fiscal year (FY2018). The following tables provide matching funds information by institution.

| Matching Funds Report- Summary | | | |
|--------------------------------|--|---|---|
| Institution | FY2013 On-going Appropriations Matched by Institutions | FY 2016 On-going Appropriations Matched by Institutions | FY 2018 On-going Appropriations Matched by Institutions |
| University of Utah | 600,000 | 1,217,809 | 1,540,000 |
| Utah State University | 270,000 | 515,000 | 900,000 |
| Weber State University | 88,000 | 440,000 | 840,000 |
| Southern Utah University* | Did not receive funding in FY2013 | Did not receive funding for faculty positions in FY2016 | 60,000 |
| Snow College | Did not receive funding in FY2013 | 113,000 | 60,000 |
| Dixie State University | Did not receive funding in FY2013 | 175,000 | 60,000 |
| Utah Valley University | 370,000 | 375,000 | 480,000 |
| Salt Lake Community College | 72,000 | 57,000 | 60,000 |

| Matching Funds Detail for FY2018 | | | | | |
|----------------------------------|--------------------------|------------------------|------------------|------------------|------------------|
| Institution | Faculty Type | Department | Appropriated | Match | Total |
| University of Utah | 2 Faculty | Bioengineering | 121,500 | 121,500 | 243,000 |
| | 1 Faculty | Chemical Engineering | 62,500 | 62,500 | 125,000 |
| | 2 Faculty | Civil Engineering | 119,875 | 119,875 | 239,750 |
| | 3 Faculty | Electrical Engineering | 195,225 | 195,225 | 390,450 |
| | 5 Faculty | Mechanical Engineering | 311,500 | 311,500 | 623,000 |
| | 11 Faculty | School of Computing | 717,500 | 717,500 | 1,435,000 |
| | Support | College of Engineering | 11,900 | 11,900 | 23,800 |
| Total | | | 1,540,000 | 1,540,000 | 3,080,000 |
| Utah State University | 2 Assistant Professors | Civil Engineering | 121,910 | 121,910 | 243,820 |
| | 3 Professors of Practice | Computer Science | 158,264 | 158,264 | 316,528 |
| | 2 Assistant Professors | Computer Science | 127,020 | 127,020 | 254,040 |
| | 4 Assistant Professors | Electrical Engineering | 247,161 | 247,161 | 494,322 |
| | 3 Assistant Professors | Mechanical Engineering | 190,895 | 190,895 | 381,790 |

| | | | | | |
|-----------------------------|---------------------------------|--|-----------|-----------|-----------|
| | Assistant Professor of Practice | Mechanical Engineering | 54,750 | 54,750 | 109,500 |
| Total | | | 900,000 | 900,000 | 1,800,000 |
| Weber State University | Assistant Professor | School of Computing | 54,340 | 54,340 | 108,680 |
| | 3 Instructors | School of Computing | 140,855 | 140,855 | 281,710 |
| | To be hired | Searches for new faculty to start FY2019 | 644,805 | 644,805 | 1,289,610 |
| Total | | | 840,000 | 840,000 | 1,680,000 |
| Southern Utah University | Assistant Professor | Engineering & Technology | 60,000 | 60,000 | 120,000 |
| Total | | | 60,000 | 60,000 | 120,000 |
| Snow College | Instructor | Software Engineering | 60,000 | 60,000 | 120,000 |
| Total | | | 60,000 | 60,000 | 120,000 |
| Dixie State University | Assistant Professor | Mechanical Engineering | 60,000 | 60,000 | 120,000 |
| Total | | | 60,000 | 60,000 | 120,000 |
| Utah Valley University | Assistant Professor | Electrical Engineering | 120,000 | | 120,000 |
| | Assistant Professor | Mechanical Engineering | 120,000 | | 120,000 |
| | 2 Assistant Professors | Civil Engineering | 240,000 | | 240,000 |
| | Assistant Professor | Master Computer Science | | 127,000 | 127,000 |
| | Assistant Professor | Master Cybersecurity | | 153,000 | 153,000 |
| | 2 Lecturers | Computer Science | | 200,000 | 200,000 |
| Total | | | 480,000 | 480,000 | 960,000 |
| Salt Lake Community College | Assistant Professor | Computer Science | 60,000 | 60,000 | 120,000 |
| Total | | | 60,000 | 60,000 | 120,000 |
| System Total | | | 4,000,000 | 4,000,000 | 8,000,000 |