Potential Actions for the Academic Strategies Committee

Graduate Education

Introduction

Oregon’s prosperity depends on a highly skilled workforce capable of leading innovation and driving the economy. Oregon competes in a global society, where research and innovation are essential to economic and social progress. Graduate education provides a proven and most cost-effective method of educating and training a citizenry that is able to address society’s complex and broad range of problems. While there are many different dimensions of graduate education, this proposal pertains to two key elements—doctorate education and professional science master’s program.

A recent national report\(^1\) pointed to the critical role of graduate education in the generation of new knowledge that has led to scientific, technical, and social advances which, when translated into products and processes, directly impact both our prosperity and our security. The report states, “Graduate education, a vital part of the U.S. educational system, must be strengthened as part of a national strategy on innovation and competitiveness. The work of graduate students contributes directly to our sustained economic growth and prosperity. Graduate students conduct groundbreaking research in universities, national laboratories, and private industry” (p. 1).

Dr. Ralph Cicerone, President of the National Academy of Sciences, has stated that the lifetime increment in earnings of a worker with a master’s degree is $0.5 million more than a worker with a bachelor’s degree. For a doctoral degree the increment is $1.4 million over the bachelor’s degree. Increasing the number of workers in Oregon with advanced degrees will have a lasting effect on its economy.

Oregon’s universities must be able to attract the most talented graduate students within an increasingly competitive environment both domestically and globally. However, Oregon’s ability to compete globally, from a solid foundation of strong graduate programs and advanced degree production, has been eroded over the past decade or more by diminished state resources. While the number of doctoral degrees in the U.S. grew by more than 10% during the last ten years, the number in the OUS has remained relatively flat. These trends and the urgent need to address them drive this proposal.

Synopsis of Recommendations

The OUS Provosts’ Council recommends that the OSBHE consider a policy option package for the 2011-2013 legislative session that is focused on increasing competitiveness of OUS institutions’ graduate programs in the following two areas:

1. Doctoral education in three signature areas identified as critical components of economic development in Oregon: Sustainability, Health/Life Sciences, and Engineering, Applied Science and Advanced Manufacturing
2. Professional Science Master’s Programs

Building Capacity of Targeted Doctoral Programs

Building capacity of doctoral programs is critical to developing a sustained and robust research enterprise that can compete nationally to attract federal and private resources for research, and is a consistent source of new knowledge and translational research for economic development in the State.

During the 2007-2009 legislative cycle, the Oregon legislature provided targeted funding for establishing the signature research areas of Oregon Bioeconomy and Sustainable Technologies (BEST), Oregon Translational Research and Drug Discovery Institute (OTRADI), and Oregon Nanoscience and Microtechnology Institute (ONAMI). These three research areas correspond directly to the areas recommended for investment in this proposal: Sustainability, Health/Life Sciences, and Engineering, Applied Sciences, and Advanced Manufacturing. Additionally, the Oregon legislature has provided targeted funding for the past decade to increase the capacity of OUS institutions in undergraduate degree programs in engineering and computer science through the ETIC (Engineering Technology Investment Council) funding process. Increasing capacity of doctoral programs will complement ETIC funding that has focused on increasing workforce in engineering and computer science, identified as a critical shortage area in Oregon.

Initial seed funding from the Oregon legislature has enabled the development of basic organizational infrastructure for the signature areas, BEST, OTRADI, and ONAMI. All three areas represent intercampus and interdisciplinary collaborations and have the potential to significantly leverage institutional strengths across the OUS. While all three areas build on existing strengths in the OUS institutions, targeted recurring funding is needed to increase competitiveness of OUS institutions nationally and internationally to a level where they can effectively compete for resources—faculty, graduate students, and funding. To this end, funding is requested for the following three activities:

1. Increase the number of faculty in strategic areas of Sustainability, Health/Life Sciences, and Engineering, Applied Sciences and Advanced Manufacturing.
2. Increase the number of doctoral students for education and research in the three areas through competitive fellowships.
3. Enhance shared physical and IT infrastructure to enable faculty and students to conduct leading edge research.

Professional Science Master’s (PSM) Programs

Professional Science Master’s (PSM) programs, described by some as MBA for scientists, are being increasingly used to connect students in science and mathematics to business and industry. Unlike a research-based M.S. degree, the PSM degree comprises of curriculum that is typically two-thirds in an emerging or interdisciplinary area in science, mathematics, or technology and one-third business and management, and includes an industry-based internship.

There has been significant growth in PSM programs in recent years, primarily driven by a need for innovation, competitiveness, and training of a skilled workforce. Last year, the National Research Council identified PSM programs as vital to U.S. competiveness. And earlier this year, the American Recovery and Reinvestment Act allocated $15 million to the National Science Foundation for the establishment of PSM programs.

The OUS institutions have started developing PSM programs. Portland State University and Southern Oregon University will start their first PSM programs next year. And Oregon State University, which started the state’s first PSM program five years ago, is leading an effort to create a multi-campus program focused on renewable energy. This proposal requests funds to increase the development and implementation of PSM and related programs at OUS institutions.
## Potential Actions for the Academic Strategies Committee: Graduate Education

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| Strengthen doctoral education in critical need areas:  
  - Sustainability  
  - Health/life sciences  
  - Engineering, applied science, technology, advanced manufacturing | Stagnant growth pattern in OUS doctoral programs over the past decade, compared to increases nationally  
Lack of investment in building faculty capacity and building a sustained pool of graduate students | New funding required to increase faculty capacity and enhance research infrastructure in targeted areas, and to provide competitive fellowships to attract students to the doctoral programs | |
| Develop Professional Science Master’s (PSM) programs in OUS | While some science master’s programs in OUS universities could be easily expanded to meet PSM requirements, there are no official PSM programs currently in OUS | Review and revise Board and Provosts’ Council policies as needed to include PSM degree option | Leverage existing resources and develop partnerships to create new PSM programs in OUS where needed | Some funding required to leverage existing resources |

*These proposed actions were developed by the OUS Provosts’ Council in consultation with the OUS Research Council and Sustainability Initiatives Committee.*