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***Committee on Education and the Workforce***

Chairwoman Foxx, and members of the committee, thank you for including Wichita State University here today. Chairwoman Foxx, I also appreciate that you have spent time on our campus, and I know you are aware of some of the major initiatives underway that are focused on addressing the emerging needs of our part of the U.S. with regard to economic innovation, creativity, entrepreneurship and technology. This is an integrated approach to focusing the mission and direction of the university in an effort to have maximum positive impact on students' education; the region's competitiveness; and America's global positioning for the future. I am sure that the committee is aware of the broad discussion nationally regarding the revolutionary times in which we live that are being driven by what are termed the Third and Fourth Industrial Revolutions. Various technologies are driving not only new products and processes, but even how we organize our economy and how we operate as a city, region, state and nation. This is what WSU is attempting to address.

The future of post-high school education is already changing dramatically and it will continue to change in ways that are not fully predictable. To address these changes, WSU is taking many concerted actions:

- This month we finalized our affiliation with the local technical college that now is named "WSU Tech." Because of this affiliation, we can accomplish more strategic programming and offer students opportunities that are nearly unparalleled in the U.S. We refer to our ability to educate and train as providing educational opportunities from the "GED to the Ph.D." And, we are seeking permission from our Board of Regents to offer the Bachelor's of Applied Science degree in addition to the Bachelor's of Applied Arts degree we recently started offering to allow for seamless transitioning from the AAS to the bachelors. It also encourages sharing of facilities and gives traditional university students ready access to technical training if they so desire.
- We also are keenly aware of the need for what is now being termed continuous education and the need to open tertiary education to people who are working, as well as the many who have found that traditional schedules and academic semesters or quarters do not work for them. These are many of the most important people that we can bring in to education if we are going to improve American competitiveness. Therefore, we developed a new approach to education which we call "badges." Unlike traditional badges, these are academic credit bearing courses that meet regional accreditation standards and appear as academic credit on the student's transcript. They carry .5 to 1.0 credit hours each depending on the specific course, and they can be aggregated into certificates and used toward degree requirements. We anticipate that

over time, they can become the basis for new forms of bachelor's and master's degrees that are highly flexible, enabling the student to meet his or her own educational goals and allowing recombination to address emerging changes in the economy and society in a much more timely fashion, without loss of academic rigor or quality.

- WSU has implemented one of the first master's degrees in the nation focused on Innovation Design. While there is a thesis option, this master's is focused on design thinking and encourages the student to create a new product, process or technology. Students also are encouraged to create products that can be patented, marketed and/or create new business opportunities. It is an interdisciplinary degree involving disciplines such as engineering, business and fine arts, and coursework is specifically designed to help the student achieve her or his design goals.
- Finally, we are in the process of implementing a program of academic paid apprenticeships in which students are given the opportunity to work in their fields of study for pay on real projects. So far, most of these apprenticeships are in engineering, but we are looking to extend and expand these offerings so that students who have interest can be given the opportunity.

These are but a few examples of how we are attempting to address educational opportunities. In addition, WSU is working hard to link its mission to the nature of our metropolitan region and its long-term competitiveness. With support of the Kansas Board of Regents, the City of Wichita and Sedgwick County, WSU has under development an Innovation Campus that we intend to become the engine for creating an innovation district surrounding the institution, one that focuses on increasing the competitiveness of the region and diversification of its economic base. Some specific examples:

- The regents approved WSU offering in-state tuition to residents of the major metropolitan areas outside of Kansas (i.e. Missouri, Oklahoma and Texas) to which the region ships many of its trade goods that generate wealth. Kansas has a total population of 2.8 million, but under this policy, the "State of Wichita" now has 14 million residents. As a result, for the third year in a row we anticipate having the largest freshman class in the history of the university, thus bringing increasing numbers of bright, capable people to the metropolitan area who can be encouraged to stay and become part of the area's future workforce.
- We are working closely with various levels of government and private enterprises to increasingly link academic and research capacities to the clusters of innovation that will drive the future of this region. At the same time, we are working with faculty members to strengthen and broaden programs that contribute to the quality of life in the region so that high-skill, high-capacity people who can choose to live anywhere end up

choosing to be in Wichita.

- Because of the speed and unpredictability of change, WSU is encouraging development of programming that integrates cross-disciplinary knowledge from the liberal arts and professions that reflect the emerging needs of the economy, community and society. We are providing educational opportunities to traditional students by providing an engaged campus, portions of the population who have found it difficult to access tertiary education through online programming, and those who are employed who require continuous learning and education through alternative credentials such as badges. We are exploring new modes of delivery of education while focusing on maintaining high academic quality so as to increasingly support the competitiveness of our graduates, community, region, state and nation.

If you follow athletics, you will know that our mascot is unique—it is a wheat shocker. This mascot reflects the institutional history where many students worked in the wheat fields that used to surround the university. That is how they paid for their education. Well, madam chairman, we have never forgotten our roots of serving the hard working people of our region and state. And, as we like to say in our part of the world: It is a Great Day to be a Shocker! Thank you Representative Foxx and members of the committee. I would be happy to respond to any questions.

***Appendix: Recommendations for Federal Policy to Promote Higher Education Innovation: Considering Bayh-Dole 2.0***

In 1980, a distinguished member of this House, Burch Bayh of Indiana and Senator Bob Dole of Kansas carried through Congress a very significant law known as the Bayh-Dole Act. The law opened up university technology transfer and substantially contributed not just to increases in patenting and licensing by universities, but led to creation of dozens of research and technology parks at universities across the country. In the nearly four decades since passage of Bayh-Dole, a great deal has changed, and it is time for Congress to consider developing and passing a second version of this most important act. Specifically, “Bayh-Dole 2.0” should emphasize:

- **Universities must maintain service to traditional students while broadening their reach to new populations. Rapid change in the higher education system is forcing different ways of delivering educational content, discovery of new knowledge and connecting to industry to solve problems.** With state and university resources stretched to support existing programming, transition assistance to the new forms of programming would both speed implementation and assist in assuring quality. In part, this transition would be assisted by financial support, but costs could be reduced if federal regulations are eased in other areas so internal university funds could be

repurposed. Reducing the cost of regulations is an ongoing discussion at the federal level, and it is an important component of assisting universities in moving to a more modern, connected approach to meeting student needs for a high quality, meaningful education while meeting the challenge of economic competitiveness in critical STEM areas.

- **Linking real-world experience, such as is provided by academically linked apprenticeship programs, with traditional education that provides both professional and liberal learning skills, is key to the future.** Instituting effective apprenticeship programs in four-year institutions requires organization, oversight and institutional mentoring, not just mentoring by business. The quality of the student experience in any apprenticeship program or extended internship is crucial to effective implementation. It is not enough to place the student under the “mentorship” of people in private enterprise, since the meaning and use of the student may vary greatly. It is critical, therefore, that any apprenticeship program be designed with specific educational goals directly relevant to the student’s education and that the achievement of those goals be monitored and assessed. This requires a great deal more “one-on-one” time by faculty members and is both an expensive and effective form of education. Assistance in implementing these programs, if they are indeed a high national priority, would be of great value.

One of the lessons of our experience with the fledgling apprenticeship program is that “clustering” apprentices within businesses provides a more meaningful experience for students and better results for the business. This clustering also reduces the cost to the university of supporting the program since a faculty member can supervise the cluster of students more effectively and efficiently than scattered individual students. While this is not always possible or desirable, and especially if the apprenticeship is with a small business, policy that encourages clustering and joint business and university planning would be of great benefit.

- **Incentivize faculty members who are willing to take on the critical applied research and education roles that are necessary for national competitiveness.** There is very little incentive for faculty members to take on these intensive roles given traditional reward systems in most institutions. University faculty members at research universities are generally rewarded through prestige (the perceived value by colleagues of their research) or by salaries and titles tied to traditional teaching, research and service. Implementing new models of education linked to broader community need could be greatly benefitted by national recognition that focuses specifically on emerging needs, especially related to STEM. A national “fellows” program, grants only available to institutions that are committed to enhancing and enriching education within a context of applied R&D meaningful to their location and mission, or a similar program, could be

of substantial value in signaling to the higher education community that the need to refocus is of critical national interest and a high priority.

- **American competitiveness is closely tied to universities engaging in basic and applied R&D that increases the speed of innovation.** There is little to no recognition of the strong ties between regionally relevant applied R&D and effective programs to enhance students' education through applied learning, apprenticeships or extended internships. WSU's apprenticeship program has its roots in the university's research center dedicated to applied R&D. Over the decades of this center's existence, hundreds of students, especially in engineering, have benefitted from working on real projects of substantial significance to business or the military. Federal policy that strongly encourages this link between education and applied R&D can both enhance the student's education and produce greater economic competitiveness. At the same time, the ongoing interaction between university researchers, business or government agencies creates an intimate knowledge of the emerging needs of that industry. From our experience, this has produced tremendous results to date. As NSF data has shown, in the area of industry-funded R&D in aviation-related fields, WSU is top in the nation by an order of magnitude.
- **Federal policy needs to recognize that most basic science funding goes to a relatively few research universities, but all research universities can be major engines of applied R&D.** Basic science research is critical for the long-term health of the American economy, and increasingly federal support for basic research has been concentrated in relatively few dominant research universities. Federal policy does not focus at the doctoral level in terms of support for applied R&D that can be impactful in the short and medium run in creating and sustaining economic competitiveness of many American regions. Perhaps it is time for "Bayh-Dole 2.0" that incentivizes strong STEM doctoral programs that are based in applied R&D partnerships with businesses.

Business has incentives to invest in universities that have strong applied R&D programs in STEM, but the universities themselves have had few such incentives. Focused doctoral student funding for STEM doctoral programs that focus on applied R&D could be of great, immediate assistance. It might be possible, for example, for a federal policy to make these funds available only to institutions that document support for such funding by STEM enterprises and could promote immediate application and increase the future supply of faculty who value, and are trained in, how to effectively conduct applied R&D within a university context.

- **Federal policy needs to recognize and support development of science and technology ecosystems that are regionally relevant and promote American competitiveness.** It is always difficult to make broad policies that affect hundreds of millions of people, and

there is a tendency to “rifle shot” policy. In the case of STEM education, recognizing in policy the importance of how the ecosystem within which the education occurs would be of great benefit.

There is a great deal of literature on why students go to college and how they choose programs and majors. If increasing the number of STEM graduates and the quality of their education are truly national goals, then recognition at the federal level of the importance of the broader ecosystem is crucial. This cannot be limited to education policy, but also involves economic development policy, urban development policy and most likely federal commerce policy.

- **Given the federal role in “accrediting the accreditors,” encouraging regional and disciplinary accreditors to create and implement policies encouraging innovation, experimentation and entrepreneurship in developing new delivery systems, new modes of education and stronger relationships between outside constituencies and universities would be of substantial benefit.** Accreditors play a critical role in quality assurance, but the impact unintentionally reinforces the status quo. Given the changes required of higher education to meet critical national need for STEM educated individuals, different approaches to accreditation that support experimentation are crucial.

No one is suggesting that accreditation should be eliminated or that it does not focus on quality. At the same time, it tends to be a conservative approach that reinforces the status quo definition of quality. Outcomes-based accreditation, rather than more input-based processes that are currently still the norm, can promote experimentation, innovation or entrepreneurial actions by universities and professions.

- **Federal financial aid currently is focused on traditional degrees taken by full-time undergraduate students, yet all indications are that non-degree short courses, certificates, stacked credentials and mixed traditional and apprenticeship programs offer great opportunity to expand the number and capacities of qualified students.** Not reaching out and supporting students with great financial need (both traditional and older students) greatly reduces both the supply of STEM-qualified individuals and limits the abilities of the regions to expand STEM-based businesses. There should be much better alignment between the federal financial aid system and the rapidly changing environment in which we all are working.
- **Federal data-reporting requirements, especially through IPEDS, are woefully separated from the emerging realities of new forms of tertiary education and new models need to recognize the importance of “continuous education” and new forms of completion including certificates and badges.** Because of how IPEDS is utilized

within higher education, this is a major limitation that reduces experimentation and innovation. The focus of IPEDS simply no longer represents our reality in higher education and tends to lead both university leadership and various external policymakers to focus on very limited outcomes measures. Rethinking IPEDS and other federal data reporting systems to align them with the new approaches to education will be a clear signal to institutions of national priorities regarding implementation of new definitions of completion and performance.

- **Federal policy needs to encourage public universities creating partnerships with external entities including business, government entities and non-governmental organizations.** Currently, federal policy does little to encourage institutions to partner with external entities, and within the academy these partnerships often are derided as “corporatization of the university.” There is very little recognition within the academy or in federal policy that traditional organizational structures that supported the industrial economy are now counter-productive in the post-industrial, technology-driven economy. Refocusing the missions of research universities to allow unique differentiation of the type of teaching, research and service they provide would be beneficial. Other countries with which we compete have already addressed this issue; for example, the development in the UK of “business facing universities.” The U.S. is very late to the table. Given the internal culture within much of higher education, policies that boost these external linkages can be of great benefit in encouraging institutional transitions to new models of education that promote quality within the highly technological, globally competitive world within which we now all operate.

In sum, it is time for Congress to consider Bayh-Dole 2.0. You can affect the competitiveness of our communities regardless of whether they are on the coasts or in the national heartland. Your actions in this and the next session of Congress can mark the re-emergence of American competitiveness and drive the quality of life for future generations of Americans across the states.