



AGENDA ITEM

B-2. Discussion of Strategic Plan Working Documents - Benchmark II..... Walter Davenport

Situation: Benchmark II of the strategic planning process requires each Committee to identify the major issues facing higher education in this strategic priority area (Economic Impact), as well as explore solutions peers are implementing to address these issues.

Background: Through the strategic planning process, which is currently underway, the Board of Governors seeks to develop a set of goals to drive the work of General Administration and constituent institutions for years ahead. The Board of Governors aims to approve a small set of system-wide goals this fall, which will form the basis for the University of North Carolina’s strategic plan.

Assessment: The attached working document for Benchmark II requires additional discussion. After completing this portion of the work plan, the Committees should have a common understanding of the major issues facing higher education in this strategic priority area, as well as some approaches peers are implementing to address these issues.

Action: This item is for discussion only.

Benchmark II: Evaluate National, State, and University Landscape, Strengths, and Gaps

Due Date: September Board Meeting

Instructions: The committee should use Benchmark II to assess what is happening nationally and statewide in this strategic priority area. The committee should also assess the needs of the state in this strategic priority area. The committee should then use its understanding of the national and state landscape, including its challenges and successes, to assess the University's current strengths and gaps within the landscape. This step may require the committee to seek relevant expertise within and outside the system. For example, the committee may consider consulting nationally-recognized experts in the field, research-based literature, Board-approved peers, as appropriate, and University stakeholders between Board meetings. To complete Benchmark II, the committee should respond to the questions outlined below.

Questions:

What do research and practice show as the key issues higher education is facing across the country/state in this strategic priority area?

Businesses and communities are calling on universities to work as partners in response to both immediate and long-term economic challenges. The twin challenges of globalization and automation have left millions unemployed or underemployed in the near-term, and N.C. State economist Mike Walden projects that 1.2 million jobs, blue collar and white collar, will disappear from North Carolina over the next twenty years. Universities must be more responsive, developing students with the skills to meet both our current and future needs, improving our ability to translate discoveries into value in the present and make more breakthroughs in the future, and finding ways to make our knowledge and expertise more readily available to the businesses, policymakers, and communities that need help.

Challenge 1: Adjusting educational offerings to meet known and future needs of employers and communities

Across the country, universities are looking for the best way to respond to companies' increasing demands for students who can be both immediately productive in the workplace and can help them innovate their way into the future. For example, a 2015 Hart Research survey of 400 employers showed that employers place significant emphasis on hiring students who have applied learning skills (94% said they would be more likely to hire someone who had completed an internship), but also valued students with long-term problem-solving skills (91% said that critical thinking, communication, and problem-solving abilities are more important than a potential employee's undergraduate major). The challenge for educators is to find a way to meet near-term needs in critical workforces while taking on a challenge first laid out by "Shift Happens" in 2006: "preparing students for jobs that don't yet exist, using technologies that haven't been invented yet...to solve problems we don't even know are problems yet."

In response, universities and university systems are looking for new ways to improve responsiveness to known and anticipated education needs, experimenting with new ways to ease students' transition into or back into the workplace while preparing them to meet the needs of the fast-changing world.

Challenge 2: Maintaining and increasing UNC's stature in research to meet future challenges

A series of analyses have documented decreasing rates of investment by U.S. companies in both research and development (R&D) (an 8.7% decline as a share of total investment) and basic scientific research (a 27% as a share of the total) over the past two decades. This puts new pressure on universities to strengthen the innovation pipeline and speed up the time between discovery and commercialization. Currently North Carolina is a top four state in attracting academic research dollars, but ranks below that national average in commercialization of technology. UNC has untapped potential to increase its economic impact by more effectively moving research discoveries to the market.

Universities across the country are pursuing innovative ways to speed up commercialization of discovery, while building their capacity to discover the future through new partnerships across disciplinary lines and with business and community partners.

What are peer systems or states doing to address these issues? Examples may include institutional initiatives that may be scalable to the system level.

A) Improving the Match of Higher Education Graduates to Current Jobs

Universities are taking steps through teaching and partnerships to strengthen the workforce and meet known current economic needs.

1. Focus Degree Programs for Economic Impact

Some fields of study are of particular importance to the economy of a state. A university system could use incentives to increase majors in particular subject areas.

The Choose **Ohio** First Scholarship Program, started in 2009 by the University System of Ohio, responds to requests from Ohio businesses to increase the number of STEM-educated graduates by focusing on recruiting and retaining students in science, technology, engineering, mathematics and medicine (STEMM). Funding for the scholarship program reached \$17mm in 2014-2015, and the number of degrees has increased by almost 50%.

In **Pennsylvania**, the Higher Education Modernization Act creates a new mechanism for universities to establish new doctoral programs in response to business needs.

2. *Emphasize Experiential Learning to Ensure Match with Workplace Needs*

A growing body of research shows that experiential learning enhances academic success and improves near-term student success in the workplace following graduation.

Georgia: Beginning this fall, entering freshmen in the University of Georgia will be required to complete at least one experiential learning activity prior to graduation. These activities might include an applied learning “capstone” course, a study abroad experience, service learning, significant undergraduate research, or an internship at a business, with the idea that such experiences build critical thinking skills and better prepare students for work or advanced study following graduation.

New York: In 2015, Governor Andrew Cuomo’s Executive Budget included a requirement that the CUNY and SUNY systems make experiential learning opportunities a graduation requirement.

3. *Make It Easier for Citizens to Update Education*

Online, continuing education, and non-degree programs offer critical access options to meet the needs of citizens in career transition or students seeking courses not available at their current institution.

Pennsylvania and **New York** have both significantly expanded their online programs in the past three years.

In **South Carolina**, students who complete their 45 hours at one of four residential campuses are eligible to complete their degree at “Palmetto College,” an online-only university that is part of the USC system, and South Carolina Educational TV provides training opportunities for educators and emergency responders and to increase literacy.

Oregon State University offers second bachelor’s degrees in computer sciences for students looking to improve their job prospects.

4. Strengthen Partnerships Between Businesses and Regional Campuses

Each region has clusters of business activity. Universities can meet some of the needs of these business sectors through ongoing dialogue and partnership.

New York: In 2011, SUNY and the Office of the Governor established the NYSUNY 2020 Challenge Grant Program to “elevate SUNY as a catalyst for regional economic development and affordable education,” according to the program’s website. The program provides incentives for capital development on SUNY campuses and within surrounding communities in return for an agreement on tuition levels. In the first round of the program, \$140 million was awarded to four SUNY University Centers to support capital projects in their regions, with three rounds of funding since.

In 2008, the University System of **Georgia’s** Board of Regents approved a plan for the Medical College of Georgia (MCG) to form partnerships with physicians and hospitals throughout Georgia to ensure that students experience medicine at all levels, in rural and urban areas. MCG now utilizes more than 200 urban and rural sites across Georgia for training.

B) Preparing Students for the Economy of the Future

Some institutions are focusing on better preparing students for the fast-changing global economy by emphasizing interdisciplinary connections, creativity and entrepreneurial thinking.

Increase Student Creativity and Entrepreneurial Skills to Prepare Students for a Fast-Changing World

Arizona: Arizona State University aims to “become a place that empowers individuals to be entrepreneurial.” As part of its stated belief that any knowledge area “provides a base for innovation,” ASU requires all entering freshmen to take an introductory entrepreneurial course that “plants the seeds of interest” that might encourage students toward entrepreneurship. Following that course, there are specialized entrepreneurship courses, certificate programs, case competitions, and funding sources for engineers, lawyers, artists, journalists, social entrepreneurs, and students interested in addressing global, statewide or regional challenges. Programs such as the one at the Design School (“d.school”) at Stanford bring together academics and private sector innovations to prepare future innovators to be breakthrough thinkers and doers by working in multidisciplinary teams, bringing together students, faculty and businesses, and using prototyping to help identify solutions to tangible, real-world problems. The design of the school enables “students to get a better understanding of what it means to use design thinking outside the classroom, and our partners to deepen their own innovation methodology.”

C) Applying Research and Innovation to Solve Today’s Problems

Universities are seeking to boost near-term impact by providing incentives for faculty to focus on commercialization of research, or looking for ways to move more research from discovery to commercialization.

1. **Reward Faculty for Work Leading to Intellectual Property Creation and Commercialization**
Faculty accomplishments related to commercialization activities often are not recognized in promotion and tenure policies. Some university systems are seeking to address that issue.

Maryland: In 2012, the University of Maryland System changed its criteria and procedures for promotion and tenure, adding “activities that result in the generation and application of intellectual property through technology transfer,” according to *Tech Transfer Central*. The system also changed its policy on sabbatical leave for faculty, allowing leave to engage in commercialization activities. The tenure policy and sabbatical update was part of a multifaceted effort by the University System of Maryland to promote economic growth statewide through its technology transfer activities.

In 2012, the **Texas** Tech University System Board of Regents approved revisions to its promotion and tenure policy for its faculty to place emphasis on student outcomes and commercialization. The policy specifically identifies intellectual property activities as faculty contributions to research and creative activity, and allows Texas Tech to reward professors who have made inventions or received patents.

2. **Improve Efficiency in Commercialization of Technology Through Centralization**
Some systems have centralized technology transfer efforts to enable them to more comprehensively assess and market intellectual property.

Wisconsin: The WiSys Technology Foundation was established in 2000 “to manage the intellectual property of the University of Wisconsin System to support basic research and speed technology transfer from university labs for the benefit of society” for the system’s 11 four-year comprehensive campuses.

The **Massachusetts** Technology Transfer Center (MTTC) and the **Florida** Institute for the Commercialization of Public Research 1) provide a centralized hub for technology transfer between public universities and state companies; 2) promote collaboration with key industries; and 3) support regional and statewide economic development priorities.

3. **Create and Enhance Funding Streams to Advance Commercialization of Technology at Various Stages**

Over the last five years, several universities and systems have established funds to facilitate development of university discoveries. These fall into three broad categories:

- a. **Proof-of-concept funds**

Missouri: The *Missouri Fast Track* program was started in 2008 by the University of Missouri (UM) System’s Office of Research and Economic Development to enhance the university’s research discoveries by moving faculty-developed ideas further down the commercialization pipeline. The program’s website indicates, “From the projects funded

under the program, numerous patent applications and license agreements resulted, as well as the raising of more than one million dollars in research funding and investment capital.” The Fast Track program provides up to \$50,000 per selected proposal.

Programs based at the University of **Wisconsin** System (the Ideadvance Seed Fund) and **Colorado** (the Colorado State University System Venture Capital Fund) have similar goals.

b. **Venture Funds**

Texas: The *UT Horizon Fund* was created in 2011 by the University of Texas System’s Board of Regents to accelerate the success of UT-system-based companies. A venture fund for UT-related companies, it has \$50 million in committed capital and \$14 million invested to date, with 15 active portfolio companies. The fund is managed by the Associate Vice Chancellor for Innovation and Strategic Investment.

The University of **California** is raising a \$250 million fund for startups from UC-system students, faculty and alumni; the University System of **Maryland’s** fund has the same focus, with a \$25 million fund for startups.

c. **Crowdfunding for Startups**

Arizona State University and University of **Virginia**, the University of **Vermont**, the University of **Utah** have all partnered with crowdfunding sites to provide crowdfunding to campus-based startup launches; **Georgia** Tech, **Michigan** State and **Indiana** University are all seeking to develop their own platforms.

4. **Bring More Business Activity onto Campus**

New businesses can benefit from proximity to university talent and research. Locating on a university campus may provide key early support in the development of the businesses.

New York: *START-UP NY* (SUNY-Tax-free Areas to Revitalize & Transform Upstate New York) was officially launched in 2013. The program creates tax-free zones to attract and grow new businesses across the state. Under the program, businesses have the opportunity to operate tax-free for 10 years on eligible campuses and spaces. Businesses must partner with the higher education institutions in the SUNY system or other universities to secure the benefit. Press releases from the START-UP NY website indicate more than 200 companies have taken advantage of the program from 2014 to mid-2016.

“Makerspaces” bring together diverse ranges of creators in the same place to work on design or other creative projects. On the Lowell campus of the University of **Massachusetts**, the makerspace brings together students working on commercial and academic projects with non-university workforce trainees learning to operate CNC machines. Other universities across the country have similar projects underway.

5. Funding to Link Businesses, Universities

Universities can provide some assistance to businesses through their public service function. Other kinds of more intensive assistance would require additional funds.

Rhode Island: The Rhode Island Commerce Corporation was legislatively established in 2016 as a quasi-public agency to enable small businesses to unlock R&D capacity through the use of “Innovation Vouchers.” The idea, based on similar programs in the UK, Europe and Canada, provides awards of between \$5,000 and \$50,000 to small businesses (fewer than 500 employees) to support projects with “knowledge partners” (universities, medical centers, or other research entities), who might help with business process consulting, access to research or scientific expertise, assessment or improvement of product value, or other services.

A more ambitious version of the idea is underway in **Canada:** The Business Innovation Access Program (BIAP), which is administered by the National Research Council Canada, was launched as a pilot in April 2014 with \$20 million in funding. The program enables small and medium-sized enterprises to access business services or technical assistance at Canada’s leading research institutions and publicly-funded research organizations for the following services: product optimization; process development, analysis, or optimization; specialized testing; market research; market strategy development; competitive analysis; and business strategy development. Small to medium sized enterprises can apply for up to \$50,000 but not more than 75% of the project cost.

C) Developing Research Capacity for Long-term Impact

Universities are increasing their long-term economic impact by engaging in fundamental and applied research to help solve the problems of tomorrow and through targeted recruitment and retention of faculty.

1. Increase Economic Impact by Providing Incentives to Retain Faculty Generating Significant Research

The competition for faculty is increasing, with some systems launching significant efforts to attract and retain high-profile faculty.

Texas: In June 2015, Texas created the *Governor’s University Research Initiative* to help recruit Nobel laureates and National Academy members to Texas public universities to serve as a catalyst for economic development. The program is managed by the Texas Economic Development and Tourism Office within the Office of the Governor and is a complement to the University of Texas System’s *Science Technology Acquisition and Retention (STARs) Program*. The STARs program, created in 2004, made awards from the system’s permanent endowment to attract and retain the best qualified faculty, purchase state-of-the-art research equipment, or make necessary laboratory renovations to encourage faculty members to perform their research

at a UT institution. Allocated funds for STARs Program in 2016 were \$15 million, up from \$10 million in 2015.

2. Increase Research Focus to Increase Impact

As problems become more complicated, some systems are identifying areas of research focus that build off of collective strengths or address critical gaps.

Missouri's Interdisciplinary Intercampus Research Program was created by the University of Missouri system in 2013 to increase interdisciplinary and intercampus research collaborations to leverage the intellectual capital and resources at the four University of Missouri campuses. Funding was to be used to seed the development of proposals to be submitted to federal agencies for establishing centers, with an emphasis on high-impact research focused on the current 21st Century Grand Challenges put out by the White House, or addressing significant national problems/priorities. In 2013, the system provided \$1 million for the program and made 15 awards before suspending funding due to budget problems.

The **UC Davis** Grand Challenges in Research Initiative program was launched in 2011 to support competitive research in science and engineering and the arts and the humanities and to provide support for proposal development; connections to industry and foundation partners; assistance with protection of intellectual property; support for startups; marketing; and budget review.

At **Johns Hopkins** University, the Discovery Fund Synergy and Innovation Awards provide awards of up to \$100,000 for faculty members to develop novel collaborative research projects to increase interdisciplinary research.