The Entrepreneurial University: What Are the Challenges?

APLU June 11, 2013
Mary Jo Waits
Key State Public Policy Themes

• Budget and Revenue: Severe and persistent recession; Revenue still not at 2007 rates; Budget Sequester
• Medicaid and Health Costs
• Government Redesign and Performance
• Evidence-Based Policy; Invest in What Works; Fix What’s not Working
• Job Creation: All-hands-on-deck Approach
Budget and Revenue

Colleges and universities must compete for fewer resources today and in the future.
Government Redesign and Performance

Biggest challenges facing higher education today: “high prices, low completion rates, and too little accountability.”

U.S. Secretary of Education Arne Duncan
The TIME Higher Education Summit
October 18, 2012
Measuring Performance
Common Completion Metrics

Progress Metrics
Measures of interim achievements strongly linked to student success

- REMEDIATION: ENTRY and SUCCESS
- SUCCESS in FIRST-YEAR COLLEGE COURSES (1st yr. math and English)
- CREDIT ACCUMULATION
- RETENTION RATES
- COURSE COMPLETION

Outcome Metrics
Indicators of successful outcomes

- DEGREES AWARDED ANNULARY (# and change over time)
- GRADUATION RATES
- TRANSFER RATES
- TIME and CREDITS to DEGREE
Measuring Performance: Efficiency and Effectiveness Metrics

- **Meeting Workforce Needs**
  - Certificates/Degrees relative to employed adults with a postsecondary credential
  - Certificates/Degrees relative to adults in the state with no postsecondary credential
- **Student Output Relative to Input**
  - Certificates/Degrees per enrollment
- **Return on Investment**
  - Certificates/Degrees per state appropriations and tuition revenues
  - Certificates/Degrees per education and related spending
- **Quality (Student Learning)**
  - Direct measures of learning
  - Indirect measures of learning
  - Measures of the learning environment
U.S. Not Getting Back Many of the Jobs Lost During the Recession
Recent Trends Suggest U.S. Economy Has Turned Soft on Risks

• Companies add jobs more slowly
• Investors put less money in new ventures
• Americans start fewer businesses and are less inclined to change jobs or move for new opportunities
• All three reverse prior trends

Risk-Adverse Culture Infects U.S. Workers, Entrepreneurs, WSJ, 6-3-13
Jobs for Unemployed Americans

“It’s time to stop obsessing about how we’ll pay benefits to retirees in 2035 and focus instead on how we are going to provide jobs to unemployed Americans in the here and now.”

Economic Development in the State of the States

The top 100 words governors used when discussing economic development in their 2013 state of the state addresses.
“ALL-Hands-On-Deck” to Boost State Economic Growth

• Growth will need to accelerate sharply to undo the damage caused by one of the worst recessions in modern times
• America gradually losing its pre-eminent position in innovation
• Mature industries needing to upgrade to realize growth potential
• Widespread abandonment of properties occurring in states and cities
• Education producing too many workers who have low skills, poor skills, or the wrong skills
Five Positive Signs on the Horizon

- **More Diplomas**: High school graduation rate has risen—to 78% in 2010, highest figure since 1974
- **New Knowledge, Less Cost**: When it comes to education, an even greater productivity gain may be on the way
- **Lower Health Care Inflation**: The growth rate in health care costs has been slowing for the last 4 years (Much of it appears to be driven by efficiencies, rather than the recent recession)
- **Powering America for Less**: We appear to be at the start of a new era of cheap energy. Through advances in both oil and natural gas production, the US is again becoming a leading exporter of fossil fuels

Source: Tyler Cowen, The Great Stagnation
Where Does Growth Come From?
Role of EDUCATION, WORKFORCE & ECONOMIC DEVELOPMENT Policy

- Entrepreneurs, the individuals who seed, grow, and renew businesses;
- Education and skills, the concentration of highly educated, highly skilled individuals within economies;
- Innovation and technology, the new ideas and technologies that enter the economy and change what is produced, how it is produced, and the way production itself is organized;
- Private capital, the sufficiency and availability of debt and equity financing at all stages of company formation;
- Global markets and linkages, the businesses competing successfully in global markets; and
- Industry clusters, the firms embedded in regional clusters supported by institutions providing education, training, finance, and marketing services, which experience higher rates of job and wage growth than comparable firms not embedded in such clusters.
Doubling Down on Policy—and Expectations

• **Policy Agenda 1.0**: Getting more Americans into—and successfully out of—college

• **Policy Agenda 2.0**: Creating new, good paying jobs in the economy and making workers (current and future) ready for those jobs
Degrees for What Jobs?

• Some governors and state policy makers are beginning to move beyond their focus on getting more students to get “degrees” to asking: “Degrees for what jobs?”

• How do we know that the degrees and certificates student are pursuing are the ones they will be able to use in new jobs?

• Are we producing degrees that provide the greatest chance of yielding the most benefit—for individuals, industry, and the state economy?
FROM... State Goal 500 New Degrees Annually

TO... Market Data

State Goal 500 New Degrees Annually = 200 Healthcare Degrees + 300 IT Degrees
Helping Create Good Paying Jobs in the State

Start Ups Initiated from Universities Utah

- Utah
- West Average
- U.S. Average
- Top 10 States' Average
Growing State Economies

TWELVE ACTIONS

1. Create a competitive tax and regulatory environment
2. Put entrepreneurial activity at the top of the state’s economic agenda
3. Distinguish among different kinds of entrepreneurs and businesses—and target policies and resources accordingly
4. Cast a wide net to find entrepreneurs
5. Teach entrepreneurship skills and attitudes at all education levels
6. Build a startup environment and culture
7. Find the potential high-growth companies and help them grow
8. Get your entrepreneurs to give back
9. Help companies open doors to new customers—globally and locally
10. Reward strong ties among universities, companies, and entrepreneurs
11. Encourage entrepreneurs and companies, small and large, to build innovation clusters
12. Build ecosystems, not programs

National Governors Association, 2012
The Elements of the Innovation Ecosystem

- Institutions that attract and support the people with the talent and foresight to create new ideas;

- Industry networks that encourage interaction, stimulate further innovation, help develop specialized services to support area companies, and encourage cross-industry partnerships;

- Facilitation of entrepreneurship to commercialize concepts so that ideas, and businesses based on them, grow in the area; and

- Cultural and social amenities constituting quality of life that motivate knowledge workers and the innovation-based companies that rely on them to stay in the area.

Strategic Framework for Policy Decisions and Investments

- **Build Expertise** by building strong research capabilities and attracting world-class talent in strategic areas.

- **Facilitate Interaction** by requiring collaboration among universities and others, cultivating strong networks, shared research facilities and compact geographical areas.

- **Link diverse knowledge fields and industry sectors together** by multidisciplinary institutions, well-designed research facilities, and mixed-use research parks to ensure that creative “sparks fly.”

- **Push the application of technology and commercialization of research** by experimenting with university-industry partnerships, pioneering open IP policies and faculty tenure changes, and keeping industry engaged.
Building Expertise

- **State-sponsored Research Funds**: CA, GA, TX, NJ, NY, MI, AZ, OH, OK, VA, WA, MD, KS
  - Build upon priorities of local industries
  - Emphasize applied research rather than basic research
  - Seed research that helps solve local problems (better health outcomes, economic transformation)
  - Align university priorities with economic development goals

- **Focused Excellence**: Re-enforce existing innovation clusters as well as developing new cluster—Arizona Bioscience Roadmap, CA Institutes for Science and Innovation

- **Research Talent**: Lilly Endowment’s $100 M for “intellectual capital,” Georgia Research Alliance’s 100 Eminent Scholars, Kentucky “Bucks for Brains” $120 M in 1998, 2000 and 2005; Utah Science Technology & Research (USTAR) world-class research teams in 6 strategic areas, including nanotechnology, imaging technology, biomedical technology
Building Expertise

- **Workers and Skills:** Goals for higher education to meet STEM job needs; Credentials and Degrees for Veterans; Industry-education partnerships Automotive Manufacturing Technical Education Collaborative (AMTECH), Washington’s 10 Centers of Excellence, each located at a community or technical college; Apprenticeship Carolina (SC) $1M plus annual employer tax credits of $1,000 per apprentice has more than doubled the number.

- **New Fields and Young Talent:** ASU’s new master’s in genomics and biotech law; State University of New York, College of Nanoscale Science and Engineering, a global first, and center of excellence in nanoelectronics; Indiana’s Polytechnic Institute Applied Bachelor Degree in 3-5 years starting in 11th grade; research funds marked for young investigators.

- **Entrepreneurial “Boot Camps”:** technology entrepreneur fellowship program (e.g., Pipeline systematically identifies potential high-growth CEOs/entrepreneurs and matches them with best-in-class training, resources and mentors); well-designed competitions, e.g., MassChallenge, that provide services in “real-time.”
Facilitating Interaction and Collaboration

• **Networks:** dense localized networks of trust, reciprocity and cooperation associated with robust innovation clusters—UCSD CONNECT “Meet the Researcher”, BIOCOM, Bay Area Science and Innovation Consortium (BASIC)

• **Innovation Vouchers:** spur collaboration between SMEs and universities and others, CT and Iowa, Netherlands model

• **Shared Facilities:** MA’s High Performance Computing Center—state, 5 universities and companies; ASU’s supercomputer and engineering school moves to main street Tempe; test sites such as Verizon’s Innovation Center in Waltham, MA offers space, troubleshooting, and certification tools to partner companies creating advanced 4GLTE network applications, such as Ericsson, Cisco and Samsung
Facilitating Interaction and Collaboration

- **Innovation Districts:** Atlanta’s Technology Square, San Diego Torrey Pines, Research Triangle Park, PA’s Keystone Innovation Zone, WA’s Innovation Partnership Zones, Ohio Innovation Hubs; CA Institute for Quantitative Biosciences (QB3) San Francisco’s Mission Bay

- **Mega-Partnerships:** Georgia Cancer Coalition, CITRIS combines 4 CA universities—Berkley, Davis, Merced, Santa Cruz; CU-ICAR—Clemson University and BMW, Michelin and other partners for education and research; PA Nanotechnology Institute: 12 research institutions with over 4,000 researchers and $1 B of research; more and more international partnerships; Commonwealth Center for Advanced Manufacturing (CCAM) to align research and education with industry needs/global standards

- **New Institutions/Intermediaries:** “Institutes of Collaboration” or Smart Agents—Oregon Nanoscience and Microtechnologies Institute (ONAMI), QB3, MA’s Life Sciences Center, Science Foundation Arizona (SFAz)
Putting Diverse Knowledge Fields and Cultures Together

- AZ Biodesign Institute co-locates researchers from 3 fields designed for interaction, NC State Centennial Research Park, ASU SkySong-China, Georgia Tech-Korea Institute for Advancement of Technology

- Incentives (R&D funds, new colleges) to encourage cross-disciplinary research and interaction--University of Akron & P&G Bioinnovation Institute, linking materials science with biomedicine to become #1 in biomaterials and orthopedic research

- Right brain and left brain—Designers and Engineers (new ASU degree)

- Entrepreneurship across the university and particularly in S&T colleges

- Entrepreneurial “boot camps”—New England Clean Energy Council’s Clean Energy Fellowship Program, UCDavis
Pushing Commercialization

- **University-industry Partnerships, Industry and Peer Review** — force an outside look (e.g., venture capitalists, out-of-state reviewers) WA Life Sciences Discovery Fund, SFAz, Utah Science Technology and Research (USTAR) “small-light-fast money” for startups and researchers

- **Focus on Problem-solving** — new energy sources, traffic congestion, chronic diseases (Proof of Relevance); solving common industry technological challenges

- **Industry Cluster Focus** — North Dakota State University’s Center of Excellence in Surface Protection, Delaware’s Center for Translational Cancer Research

- **Update Patent, IP, Tenure Policies** — master agreements to fit open-innovation business model, reward faculty entrepreneurs

- **Regulations and Procurement** — green technologies, energy efficiencies

- **Venture Financing** — Oregon, Maryland, Connecticut, United States Treasury Department’s $1.5 billion State Small Business Credit Initiative (SSBCI)
Who Coordinates Key Elements of an Innovation Ecosystem?

Source: Mary Walshok, 2010
Bootstrapping Innovation Ecosystems

• The “new” Silicon Valley Goal: a “habitat” or an ecosystem in which a distinctive collection of people, firms, institutions and relationships combine in finely tuned ways to not only provide scientific advances or technological breakthroughs but to also turn ideas into products and take them rapidly to market by creating new firms.

• Creating innovation ecosystems calls for a new approach and has resulted in extraordinary experiments. These experiments are bubbling up in response to specific needs in states. Moreover, they are showing results.

• The most promising model is what NGA calls institutes of collaboration, or IOC, which have emerged from the states’ investments in R&D.
Need for a New Model

• Turning ideas and intellectual property into jobs is not something that universities—or tech transfer offices, incubators or star scientists—can do alone;

• It is the complex interplay between academia, the private sector, public policy, and not-for-profit world that is key to turning ideas into real economic gains

• Designing a new, nimble, lean, and collaborative entity devoted to supporting firms and other organizations in their innovation activities
Institutes for Collaboration

- **Innovation is built in from the beginning as a core mission.** Their job is to build, nurture and link the elements of “an innovative place” – a local ecosystem of people, institutions, and companies that all support the innovation process.

- **They are building an innovation ecosystem for a particular industry cluster.** Connected to a particular industry from inception, they know how to create consistency from research ideas forward through the commercialization process to feed the industrial base within the state.

- **The institutes are not part of one university.** They sit at the nexus of multiple universities and aim for a “catalytic effect” that will produce results.

- **They depart from traditional university technology transfer efforts by focusing on what is required “upstream” to bring new products out “downstream”**. The goal is not to focus on just ideas or just markets, but to stimulate the entire innovation process in such a profound way that the state’s entire innovation pipeline is transformed.
These Organizations Require

- **Leaders who proactively find and nurture connections across the boundaries** and know who to connect with whom. Companies and entrepreneurs need one point of contact that will connect them with all the diverse resources they need.

- **Speed and Flexibility in working with industry.** For this reason, non-profit organizations that operate outside of the university/government orbit may be needed, but they must excel at bringing together the resources of several universities.

- **Industry Focus that allows innovation to be strategically targeted** at sectors that are promising to the state or region. At the same time, however, there is a balancing act between being sector-focused (built up around innovation process and network for one sector) and bringing together research and companies from different disciplines and industries.

- **Space That Crosses Traditional Academic Boundaries** so that innovation results from different disciplines working together. Shared research facilities push researchers, entrepreneurs and industries beyond their specializations and allow for discoveries at the boundaries of disciplines.
Intermediaries to Bootstrap Innovation Ecosystems

Oregon Nanoscience and Microtechnologies Institute

“ONAMI has emerged as a microcosm of a complete innovation strategy for a single technology area.”

– Shelia Martin, Portland State State University
California’s Institutes for Collaboration

California Institutes for Science and Innovation

Source: Regis Kelly, QB3
Institute for Collaboration

Summary of QB3

QB3 is a consortium of over 200 research labs and faculty from three leading universities:

- QB3 – Santa Cruz
- QB3 - UCSF
- QB3 - Berkeley

Source: Regis Kelly, QB3
QB3 in San Francisco’s Mission Bay

What makes QB3 different

**SCALE**
QB3 is a multi-disciplinary and multi-institutional institute with more than 200 faculty

**FACILITIES**
Access to diverse, high-quality core research facilities

**COLLABORATIONS**
Affiliation with centers of Clinical, Engineering and Industry excellence

FACILITIES

Collaborations

A vision of success through collaboration

Source: Regis Kelly, QB3
QB3 in San Francisco’s Mission Bay

Creating an Innovation Cluster

And Revitalizing Abandoned Spaces and Communities

Source: Regis Kelly, QB3
QB3 in San Francisco’s Mission Bay

The dream
A number of states are creating Innovation Hubs focusing on “eds & meds” and spaces around them.
"As we envision it, Innovation Square will be unlike anything you've seen. In fact, it will be nothing short of a complete re-invention of the town square concept." - UF President Bernie Machen
Innovation is Place-Based
San Diego: Rise of a BioTech Cluster

• Today: 3rd Biotech hub behind San Francisco & Boston

• North Torrey Pines Road: Densely packed 2-mile stretch w/ Scripps Research Institute, Salk Institute for Biomedical Studies, UCSD

• “We can throw a rock and hit UCSD. I can hit a golf ball and hit Scripps. Everything is within walking distance. That means more heads get together and we do a lot of collaboration.”

  VP at Salk Institute
Providing Critical Ingredients for Innovative Places

The most successful American places in the 21st century are likely to be innovation hubs. They are locations that support an open innovation business model, foster co-location, and promote easy and constant interaction among many different industries and a wide variety of creative workers, from artists to scientists to engineers.

New location priority: Spaces to Cluster, Interact and Thrive
“Eds and Meds” Play a Role in Innovation Hub

Downtown Phoenix

**Seven Priority Themes**
- Knowledge Anchors
- Downtown Living
- Great Neighborhoods
- Arts and Cultural Hub
- Distinctive Shopping
- Great Places/Great Spaces
- The Connected Oasis

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<td>The Walla Walla Wine/Food/Art IPZ includes the Port of Walla Walla’s business park along with two “centers of innovation”: The Port of Walla Walla and the Walla Walla Community College campus, which includes the William A. Grant Water and Environmental Center (Water Center) and the Center for Enology and Viticulture (Wine Center).</td>
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Raising Expectations for Universities and Colleges in a Global Economy

• Set Clear Expectations for Higher Education’s Role in Economic Development

• Emphasize Rigorous Use of Labor Market and Other Data (industry clusters) to Define Priorities

• Encourage Employers’ Input in Higher Education

• Require Public Higher Education to Collect and Publicly Report Impacts

• Emphasize Performance as an Essential Factor in Funding

Degrees for What Jobs, NGA, 2012