

## **Economic Development Considerations for the University System of Ohio**

Economic development at any state university must be seen as the intersection of capital – human, intellectual, and corporate. The greatest contribution that a university can make to the economy of a state, like Ohio, is the generation of students possessing an education rich in values exploration, intellectual depth, and technological literacy. The preparation of a trained, intellectual, workforce; the retraining of displaced workers; the reintroduction of individuals to the world of work; and the contributions made to life-long learning desires and aspirations, are all significant elements of the economic development mission. Assisting in the development of economic opportunities within local and regional communities and preparing individuals for “horizon jobs” must also be a significant thrust of this mission.

Inherent in organizational forward movement pertaining to the aforementioned are the following critical considerations:

- Preparing students for careers in science, technology, engineering, mathematics, and medicine (STEM<sup>2</sup>) must be aggressively undertaken.
- This STEM<sup>2</sup> developmental process, though, must also include teacher preparation (K-12 and postsecondary) in these respective disciplines. Obviously, students of tomorrow will be educated in new and different ways, so as to bring forth enhanced readiness skills for advanced study in the new economy.
- The new economy will be an economy of innovation. Innovation in all disciplines will require the sense for and proclivity toward creativity. Creativity, in the most basic of economic terms, will be a primary driver for success in the new “creative economy.”
- International relationships must be expanded. The now exploding educational demands from the middle class in emerging nations like China and India cannot be overlooked. Demands (i.e., for educational opportunities rich in depth and breadth) of these students can be met; Ohio universities must be positioned to provide such educational opportunities for these students. These students, in turn, will forever hold a world-view that includes Ohio as its base. It is this type of perspective that drives long-standing economic relationships and is the foundation for international and multinational business networks.

### Catalysts for Change

As a catalyst for economic change, several critical steps must be undertaken. In most instances, these steps will begin at the undergraduate level. Instruction will need to focus on the student as an individual, with his/her strengths, needs, and interests holding a place of centrality. The student will, in turn, be expected to take responsibility for his/her own growth and development. Included here will be opportunities for students (in collaboration with faculty and staff) to design personal degree plans, with integrated disciplinary foci, so as to be better prepared for occupational positions of tomorrow (horizon jobs), not just those that exist today. The university will provide preparation for excellence in careers, in tandem with equal levels of formal education and life-long learning opportunities. In preparing students for the “real world,” each student will be provided the opportunity to engage in supervised experiences outside the classroom, including service learning, internships, study abroad, and other enlightening possibilities.

Graduate education should build upon the success of the undergraduate experience. Graduate students must be provided opportunities to explore connections between their roles and responsibilities as faculty members and professional practitioners, their varied approaches to learning, their personal creation of teaching and learning paradigms, and their overall development as researchers-in-practice. Building upon the design first created at Virginia Tech (see [http://www.grads.vt.edu/graduate\\_school/tge/cse](http://www.grads.vt.edu/graduate_school/tge/cse)), transformative graduate education should, and will, provide a central focus on technology and, concomitantly, give a critically engaged understanding of technology utilization to and for all phases of a student’s intellectual work. Graduate students will, then, be prepared to:

- Create connections between their research and the research findings generated by said work with the external business community (i.e., applied research in action).
- Enhance organizational performance by infusing new technological perspectives and by bringing new technological usages to the classroom, laboratory, shop floor, or graphics workroom.
- Develop disclosures, patents, and licenses that benefit citizens in the new creative economy.
- Return to the university, in a professorial capacity, with the proclivity to change the existing paradigm of how future undergraduate students receive instruction and provide a radically different graduate education for all those with whom they interact.

### A Sharpened Focus for Research and Development

Without question, certain universities in the state of Ohio do, and will, engage in vastly different types of research than that undertaken by other institutions. Basic research has been the domain of particular universities, while applied research is more applicable to the type and nature of work conducted elsewhere. Regardless of system-wide organizational efforts, this pattern will not change. However, a focused approach to research and development could prove highly beneficial to all fourteen of the state universities. For example, Ohio has been ranked by the Renewable Energy Policy Project as the second largest “impact state” for job creation in an expanded wind production situation. This means that more jobs will be created in Ohio than all other states, excluding California, if wind turbine production were to be enhanced nationwide. Given President Bush’s 2006 Energy Policy demands for 20% renewable energy production by 2030 and Governor Strickland’s proclamation that, by 2025, 25% of Ohio’s electricity must come from clean energy, a focus on wind research and wind turbine manufacturing is exceedingly logical. Furthermore, given the recent determination by the U. S. Department of Energy that only a small fraction of increased electricity needs (<5%) can come from on-shore turbines in highly populated areas, specialized investments in offshore turbine development for locations in Lake Erie become even more noteworthy. Specialized R&D of this sort could focus on the following:

- Initial design structures for offshore use (it is critically important to note here that the United States, currently, has absolutely no off-shore turbines installed).
- Examination of new turbines and component parts that are better, less expensive, and more reliable for offshore use.
- Examination of lower and levelized costs for energy.
- Creation of partnerships leading to commercial development by multiple corporate entities, state agencies, and institutions of higher education.
- Generation of data to eliminate concerns and uncertainties regarding offshore wind turbine production and installation.

Other clean energy systems could be inserted into this expanded R&D profile – those might include, but are not limited to, solar, geothermal, and biomass investigations with similar targeted outcomes to those outlined here for wind research.

### Entrepreneurial Encouragement

Entrepreneurship can be enhanced on any/all campuses in a number of differing manners. First, the creation of awareness for the discipline, by bringing speakers to campus-wide events, is essential. Simply stated, these events/lectures demonstrate to students, faculty, and staff that

entrepreneurship is a highly desirable career choice. Second, degree offerings in the discipline can and should be developed. At Bowling Green State University, an entrepreneurship minor in the College of Business Administration allows students, regardless of major, to learn and understand how to use the economic system to achieve success, while pursuing their career aspirations. As is noted in an earlier section of this work, a discipline like entrepreneurship is best learned via the unification of a formal educational experience combined with experiential learning opportunities. So, in addition to the development of entrepreneurship degree offerings, genuine “entrepreneurial encouragement” will provide students with funded opportunities to complete intern and co-op activities in entrepreneurial companies that, likewise, will allow students to experience, firsthand, just what it means to be an entrepreneur.

Entrepreneurship cannot end with the degree completion if it is, indeed, to become a critical element of business-university unification for the state of Ohio. Dollars must be allocated to alumni, to enable them to gain business assistance from students and faculty at their respective alma maters. This type of programmatic design would allow graduates to return “home” to obtain excellent assistance in the realm of business startup advice and mentoring. This action would allow the university, conversely, to operate as a business incubator for alumni. Once the business is started, students will be given, by contractual agreement, opportunities to work in the new start-up business. Here the cycle would become a closed loop. Alumni would work with students for the start-up company, students would grow the company by working onsite, and the experiential element of said project would benefit the alumni and her/his new undergraduate colleagues.

A final consideration with regard to entrepreneurial encouragement must rest with the enhancement of opportunities to commercialize intellectual property created by faculty, staff, and students at the fourteen state universities. Obviously, research leads to new ideas. New ideas lead to disclosures, patents, licenses, and copyrights. However, excitement for the commercialization of these ideas is not always evident. Technology transfer offices specialize in the encouragement of practical research applications that lead to public benefit. These offices, however, should be encouraged to streamline processes, so as to allow faculty and students to quickly move intellectual property off campuses and into the public domain. Specialized seminars and symposia should be developed to bring entrepreneurial individuals, potential investors, researchers, and inventors (including students) together to engage in the discussion of ideas and concepts that might lead to commercialization of a given product or process. And, as has been seen by recent actions of grantors, like the National Science Foundation (see NSF Research Experiences for Undergraduates), additional incentives for student engagement will

increase possibilities for undergraduate and graduate students to become active in the creative process and, in turn, become joint holders of patents, licenses, copyrights, and disclosures.

**Submitted by:**  
State University

James M. Smith, Vice President for Economic Development, Bowling Green

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