



**Candidates for University System of Ohio
Centers of Excellence**



The Scripps College of Communication



Energy and the Environment



**Health and Wellness: From Translational Research
to Best Practices for Rural/Underserved Populations**

**Submitted to Chancellor Eric Fingerhut
Ohio Board of Regents
July 9, 2009**

Executive Summary

Ohio University submits three nominations for designation as University System of Ohio (USO) Centers of Excellence:

- Scripps College of Communication
- Energy and the Environment
- Health and Wellness: From Translational Research to Best Practices for Rural/Underserved Populations

Each of the proposed Ohio University USO Centers of Excellence meets the criteria set forth in the guidelines provided by the Ohio Board of Regents on May 12, 2009. The Ohio University Board of Trustees endorsed the center candidates on June 26, 2009. Information about the process used by the University to select the proposed centers can be found in Appendix I.

Our USO Centers of Excellence candidates possess academically outstanding faculty and students who have helped each proposed center develop world-class research and advance high-level entrepreneurial leadership. They are centers with a history of innovation attracting investment from outside sources such as federal agencies, industry, foundations, state government, and philanthropists. They are global in their reach while offering abundant possibilities for state and regional development. During the past six years, the combined internal and external investment for the three center candidates is estimated to be \$178,355,856. Ohio University's proposed centers also contain graduate programs with sufficient national and international reputation to attract and retain top students and faculty.

Each proposed center has prepared a report addressing the 13 components identified in the May 12, 2009 guidelines. But in response to an email sent to university presidents by Harry Andrist on June 24, 2009, a brief summary has been prepared for each center providing information on the following topics:

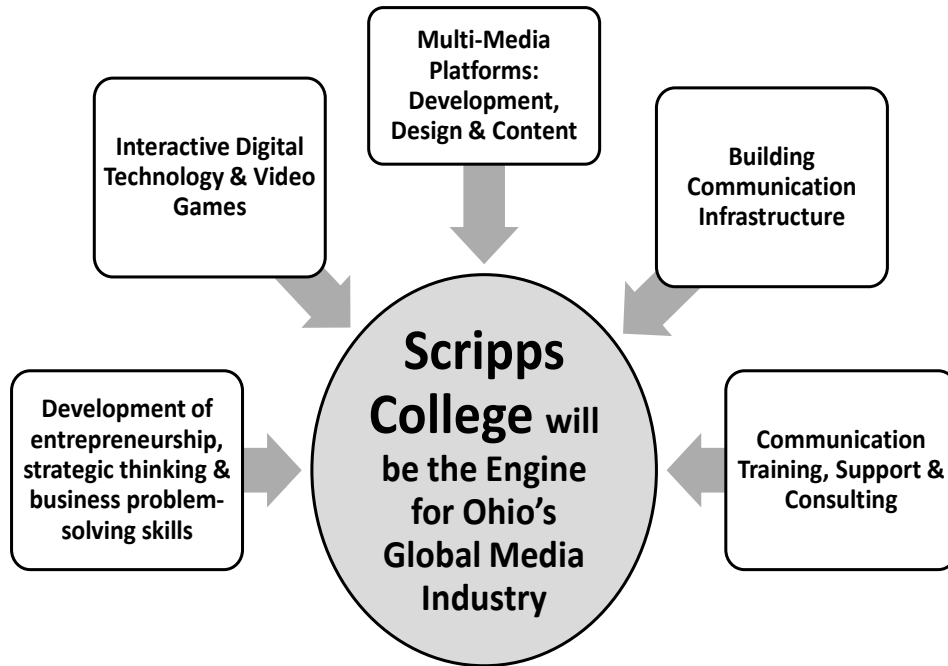
- Justification for Designation as a Center of Excellence
- Benchmarks Used to Measure Excellence
- List of Cognate Institutions with Similar Programs
- Specific Institutional Goals for Each Center
- Development Plan for Sustainability

In addition to the strengths of the proposed centers, it is worth noting the role that Ohio University plays more broadly in the University System of Ohio. Designated as one of the historic "four corners" universities, Ohio University is characterized as "residential in character and liberal arts in tradition" with "focused master's and professional degrees, and a select number of nationally-recognized doctoral programs."

The Scripps College of Communication

Global Media Industry

By 2013 predicted growth of 17.6%
[value of \$1,104.2 billion]



Justification for Designation as a Center of Excellence

The Scripps College of Communication at Ohio University is exceptional in the state and the nation because of its combined breadth and excellence. It is home to professional programs, engineering-based fields of study, humanistic and social scientific disciplines, and applied arts. It is forward-thinking, adapting its curricula, research priorities and industry partnerships to technological, economic and social changes.

The global approach to communication is changing rapidly. Significant economic opportunities exist for the state of Ohio to develop a workforce capable of making it a major contributor to the global media industry. The Scripps College is the academic partner that the state needs to become an economic leader in the global media market.

In its curricula and research, the Scripps College integrates the three key facets of modern communication: content creation, the delivery of content, and changing interfaces between content and users. This synthesis creates a college that is exceptionally strong in many areas of communication, and fosters interdisciplinary collaboration across the fields of communication to a very high degree.

Businesses in all fields, media industry companies, government agencies, philanthropists, and Ohio University have in recent years provided the Scripps College more than \$54 million in grants, contracts, awards, investments, and donations. Its faculty in the past two years have won 15 national awards. Its students have received more than 75 national awards and recognitions. Its graduate programs have been recognized by external entities such as the National Communication Association and the International Telecommunications Education and Research Association as being among the best in the nation. Its alumni receive internationally renowned awards such as

Pulitzer Prizes and gain recognition for their outstanding professional contributions by media and industry associations.

Few academic entities in the state can match the name recognition, the quality, and the economic potential that the Scripps College of Communication brings to the University System of Ohio. It is an exemplary candidate for designation as a USO Center of Excellence.

Benchmarks Used to Measure Excellence

SCRIPPS COLLEGE OF COMMUNICATION
World Class Academic Talent
Faculty Awards
Institutional Investment into physical infrastructure
Private investment into program (both capital, research, and any other private giving)
External national and international program rankings
Connection to the Industry’s Local Economy
Consulting agreements
Number of companies that have relationships with the center of excellence
Average salary of jobs created in the region or state in industries related to the center of excellence
Economic Impact
Jobs in region for the cluster
Average salary for jobs in this cluster
Graduates placed in their field in the state
Average salary of graduates

List of Cognate Institutions with Similar Programs

- Annenberg School for Communication, University of Southern California
- College of Communication and Information, University of Tennessee
- College of Communication and Information Studies, University of Kentucky
- College of Communication, University of Texas
- Communication programs at Syracuse University
- Communication programs at Northwestern University
- Communication programs at University of North Carolina, Chapel Hill
- Communication programs at University of Missouri

Specific Institutional Goals for Each Center

The Scripps College of Communication will work to recruit additional first-class faculty and students; to secure internal and external resources that will allow it to maintain state-of-the art instructional and research facilities; to pursue curricular developments that will allow it to lead in knowledge production and innovation in order to serve the needs of businesses, government agencies, and communication industries; and to continue through its teaching, research and service, to be widely known as one of the best colleges of communication in the country.

The Scripps College will focus on enabling the state and the region to drive economic advancement through the following goals:

Internally

- Design and maintain a curricular focus on entrepreneurship, strategic thinking and business problem solving
- Create award-winning multi-platform media content to serve the educational, cultural and economic needs of Ohio, the nation and the world

- Develop an enhanced focus on teaching and research in the area of interactive digital technology and gaming applications
- Take best advantage of the unique breadth of research and study in communication in the Scripps College so as to be recognized nationally through awards and rankings as a national center of excellence
- Increase externally funded research and contracts as well as books and refereed publications by faculty

Externally

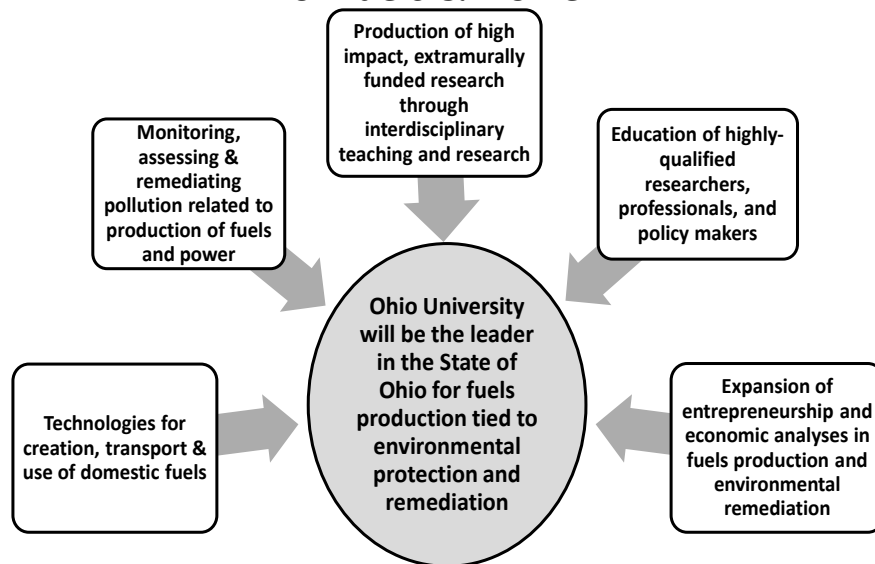
- Play a role in creating communication-related jobs in the state
- Place graduates of the college in Ohio-based companies
- Partner with private companies on commercial development opportunities
- Help build communication infrastructure in Ohio
- Provide communication training, support and consulting for Ohio companies and agencies

Development Plan for Sustainability

Resources for the Scripps College as a center of excellence will be managed through the college as a planning unit with the dean ultimately responsible for their allocation. Ohio University will continue to commit substantial funds to maintaining world-class excellence in the Scripps College. Those commitments will come through the allocation of funds for building projects and by making needs of the college central to the goals of the upcoming university capital campaign. The Scripps College as a designated center of excellence will also be recognized in ongoing reallocation of existing resources through strategic planning at Ohio University.

Energy and the Environment

National Security, Prosperity & Well Being Depend on Environmentally Sound, Domestic Sources of Fuels & Power



Justification for Designation as a Center of Excellence

The production of power and fuels has long been a major part of Ohio's economic vitality. Inexpensive electricity fueled significant industrial development. The mining of coal and extraction of petroleum and gas produces billions of dollars of revenue annually for Ohio. Yet this vital part of Ohio's economy has come at a steep environmental price, ranging from acid mine drainage that severely damages our watersheds to decreased air quality for the state.

As we move forward in the 21st century, accessible, environmentally-friendly, and economical energy is critical to the well being of Ohio and the security of our nation. The United States currently imports 60 percent of our transportation fuels, and 20 percent of our natural gas. Safe and reliable sources of domestic fuel are critical to stabilizing the cost of energy and reducing our reliance on unstable foreign energy sources. Further, the fuel must be produced and used in ways to minimize environmental impacts, ranging from generation of greenhouse gases, mercury or other air pollutants, or the effects of extraction, transport and storage.

Ohio University has established significant research, demonstration, and development strengths in the area of Energy and the Environment, focusing around the production and delivery of energy and fuels, as well as monitoring and control of the pollution that results from that production. Ohio University stands as the first university in the state to recognize the need to integrate the multidisciplinary work of energy and its related environmental impacts through the establishment of the Consortium for Energy, Economics and the Environment (CE3) as part of Ohio University's University Research Priorities process in 2005. Finally, Ohio University is unique in terms of research activity and infrastructure, as well as in geographical location in the heart of Ohio's

coal and oil fields, and the nation’s electric power “breadbasket,” the Ohio River Valley, home to almost 40% of the nation’s coal-generated electricity.

From FY 2003-2008, Ohio University faculty and staff associated with the proposed center of excellence have received \$28.1 M in external funding. Part of the largest gift ever received by a public college of engineering, the \$95 M Russ gift to the Russ College of Engineering and Technology, as much as 25% of the proceedings will be used to support the faculty and facilities needed by the center.

In its past work and its future prospects, it is clear that the proposed Center of Excellence in Energy and the Environment presents one of the best opportunities that exists nationally to bring interdisciplinary work to bear on an issue that has global significance. Designation as a USO Center of Excellence is fully justified and is an action that will enhance the ability of the state of Ohio to develop preeminence in this realm.

Benchmarks Used to Measure Excellence

ENERGY AND THE ENVIRONMENT
World Class Academic Talent
Total research expenditures
Federally financed research expenditures
Faculty awards
Private investment into program (both capital, research, and any other private giving)
Referenced publications per faculty member
Number of doctorates awarded per year
Number of post docs currently employed
Connection to the Industry’s Local Economy
Licenses and options executed (number of deals)
Industrially financed research expenditures
Invention disclosures
Number of companies that have relationships with the Center of Excellence
Regional and statewide environmental improvement: <ul style="list-style-type: none"> • River miles improved; watershed plans completed/in progress; air quality improvements; environmental education/training/outreach projects completed/in progress
Economic Impact
Jobs in region for the cluster
Average salary for jobs in this cluster
Economic output of the cluster in region
License income

List of Cognate Institutions with Similar Programs

- Center for Environmental Protection, Rutgers University
- Desert Research Institute, University of Nevada
- Global Climate and Energy Project, Stanford University
- Energy, Environment and Resources Center, University of Tennessee at Knoxville
- Institutes of the Environment, Penn State University

Specific Institutional Goals for Each Center

Ohio University has a long history of working with the power and energy industry in education, research and service in the production of energy and remediation of environmental effects. The energy industry is critical to Appalachian Ohio, the state, and the nation. It provides the power needed to supply the needs of citizens and industries to light, heat, cool, transport, and manufacture. The industry is also a critical source of good jobs for the region and the state. But the process of creating and distributing power comes at a significant cost to the

environment. The lives and livelihoods of those who live in energy producing areas such as Appalachia are significantly affected by the extraction and production of fuels. Ohio University's proposed Center of Excellence in Energy and the Environment will play a pivotal role in enhancing both the environmental and economic conditions of Appalachian Ohio, the state of Ohio, and the nation by identifying, recognizing, and addressing the energy and environmental needs of critical concern.

Towards those ends, the proposed Center of Excellence will focus on:

Internally

- Developing technologies for the low cost and sustainable creation, transport and use of fuels and power from domestic sources;
- Monitoring, assessing and remediating pollution related to the production of fuels and power;
- Creating synergistic, interdisciplinary teaching and research opportunities to produce high impact, extramurally-funded federal, state, and private research;
- Educating highly-qualified researchers, professionals, and policy makers; and
- Expanding entrepreneurship and providing economic analyses in the areas of fuels production and environmental remediation.

Externally

- Retaining energy generation jobs, the total in Ohio which is estimated to be 42,000.
- Ohio University technologies will create new jobs in green employment. According to the Pew sponsored report "The Clean Energy Economy", Ohio ranks among the top five in such jobs. We expect technologies of Ohio University's and similar technologies to generate over 1000 new jobs in Appalachian Ohio alone.
- Reducing Ohio's carbon footprint is expected to be a significant cost reduction to Ohio businesses and consumers particularly if cap and trade legislation becomes the regulatory norm for reducing carbon dioxide and other greenhouse gas emissions. Businesses that are more profitable create more jobs due to enhanced revenue availability.
- With or without cap and trade legislation, new jobs in environmental services will be required to support the regulation and reduction of carbon emissions. Ohio University expects to be a leader in education in the area of carbon management. The carbon management industry could grow to \$1B in Appalachia by 2020.
- Recovering 120 miles of streams and rivers in Ohio to attain their Clean Water Act standards. This will create 75 jobs.

Development Plan for Sustainability

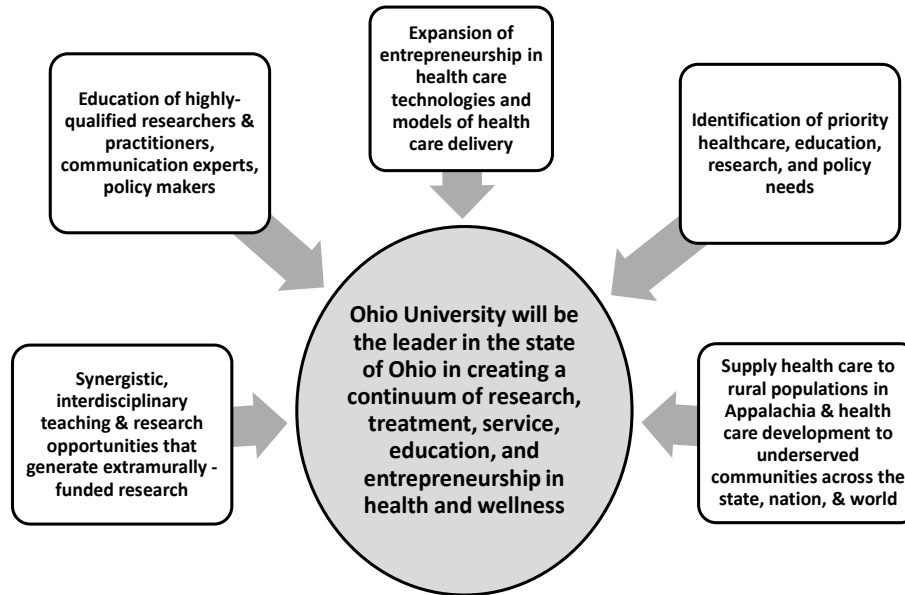
In the proposed Center of Excellence, sustainability will be maintained by building on a strong foundation (described below) and by a commitment on the part of colleges, the Office for Research and Creative Activity, the Voinovich School, and the institution to support continued growth in this area through faculty and staff hiring, pursuit of external funding and business partnerships, development of research facilities, and strengthening of graduate programs connected to energy and the environment.

Ohio University has demonstrated over the last decade sustainability by securing sponsorship and establishing an integrated infrastructure, educational programs, and faculty expertise. Some examples are:

- Centers and Institutes –Institute for Sustainable Energy and the Environment (The Center for Air Quality, Ohio Coal Research Center, Electrochemical Engineering Research Lab, Biofuels Research Group); Institute for Corrosion & Multiphase Technology; Ohio Center for Ecology and Evolutionary Studies;
- Multidisciplinary Schools and Graduate Programs -the multidisciplinary Voinovich School, which focuses on energy and environment, entrepreneurship and applied policy research, and houses the only Master of Science in Environmental Studies program at a public institution of higher education in Ohio;
- Buildings – Stocker Center, Academic Research Center; West State Street ISEE facilities; Corrosion Center, Voinovich School;
- Shared facilities – Scanning Electron Microscopy, Machine Shop (ISEE), Electro-chemical Engineering Research Laboratory (Molecular Modeling, Electrode Manufacturing Facility, Advanced Electrochemistry testing systems); Ohio Coal Research Center (solid oxide fuel cell testing facility able to handle coal syngas), Corrosion Test Equipment for high-pressure CO₂ and H₂S, Analysis Equipment for Criteria Air Pollutants, Air Quality Modeling, Geographic Information Systems Analysis; and
- University programs— As the only Third Frontier ESP in the state awarded to a public university, TechGROWTH Ohio works to accelerate commercialization strategies, open new markets for companies in southeast Ohio, and assist early-stage businesses obtain sufficient equity capital for sustainable growth. TechGROWTH Ohio has embedded Executives in Residence at the Edison Biotechnology Center, the Innovation Center and several private energy and environmental firms throughout the region. This unique model has integrated technology commercialization, company development, investment capital, and business growth in these critical areas. In effect, the university has created an integrated service infrastructure for energy and environmental businesses, which is borne out by the program's metrics which indicate that at least 21 companies have received technical and operational assistance since the program's inception in 2007.

Health and Wellness: From Translational Research to Best Practices for Rural/Underserved Populations

The Future of Healthcare Locally and Globally Depends on Reimagining the Pathways that Connect Knowledge, Treatment, & Improved Health & Wellness



Justification for Designation as a Center of Excellence

Ohio University possesses strengths in the areas of biomedical research, in healthcare education, in clinical and outreach programs, and in bringing innovative treatment methodologies to the world. Through these activities, the university is a leader in the state and region in addressing a broad spectrum of health and wellness issues.

Because Ohio University's home is in southeastern Ohio, many of our programs and services are directed toward the rural, underserved population that resides here. Thus, more than any other institution in Ohio, the university has been successful in using a community focus to create an effective health and wellness continuum. The continuum brings together nationally influential research, local wellness programming, clinical outreach, and regional economic development-- manifested in the creation of new medical products, biomedical companies, healthcare practices, and enhanced workforce productivity through access to quality healthcare. The excellence that is at the heart of Ohio University's proposed center resides in its ability to unite all of these elements together in a health and wellness continuum that is unique in the state and in the region.

The strength of the proposed Center of Excellence is evident from a variety of indicators:

- Extramural funding (2004-2008): \$28.14 M
 - Endocrine diseases: \$8.01 M
 - Cancer: \$2.84 M
 - Infectious diseases: \$3.47 M
 - Neuroscience: \$5.76 M

- Agbioscience: \$2.33
- Health & Clinical Psychology: \$5.70 M
- Researchers: >57 – from the Colleges of Arts & Sciences, Health & Human Services, Osteopathic Medicine and Engineering, and the Edison Biotechnology Institute.
- Intellectual Property Portfolio: 114 invention disclosures, 62 patent applications, 29 patents
- License Royalty: *Forbes* magazine ranked Ohio University 4th in the country for the amount of license revenue generated in relation to research funding. Royalty fees garnered by Ohio University from Somavert (John Kopchick) (FY05-08): \$14.5 M.
- Workforce Development: Due in part to technology developed by university researcher Len Kohn, Diagnostic Hybrids, an international biomedical technology company based in Athens, doubled its revenues and almost tripled its workforce in 4 years.
- Clinical Outreach: health services and education delivered *in local community settings* to more than 180,000 people (measured as encounters) per year throughout a 21-county region.

The proposed Center of Excellence in Health and Wellness: From Translational Research to Best Practice for Rural/Underserved Populations will assist the state of Ohio in not only serving some of its most vulnerable citizens, but in reimagining the pathways that link discovery, development, and dissemination. What emerges from this Center of Excellence will have a positive impact economically and on the lives of individuals locally, across the state, and around the world. Health and Wellness meets the benchmarks set forth for designation as a USO Center of Excellence and naming it as such will be beneficial for the ability of the state to enhance the lives of those who live three miles or thousands of miles from Athens.

Benchmarks Used to Measure Excellence

HEALTH & WELLNESS
World Class Academic Talent
Total research expenditures—including research and sponsored programs and sources of funding (State, Federal, other)
Private investment into program (both capital, research, and any other private giving)
Referenced publications per faculty member—lists of reference publications, rather than citations, will be used as the Center spans multiple fields where tracking citations are complicated by the existence of multiple sources and standards for reporting citations
Connection to the Industry’s Local Economy
Licenses and options executed (number of deals)
Invention disclosures—patent applications will also be tracked
Startup companies resulting from Centers of Excellence – in addition, value added to existing small companies (e.g., DHI), including increased revenues or workforce, will be tracked.
Economic Impact
Graduates placed in their field in the state--will be tracked for medical students, nursing students, speech-language pathologists, audiologists, physical therapists, and athletic trainers specifically, as a major objective of both programs is workforce development for the local underserved region.
License income
Number and types of patients served annually via Community Health Programs, OU-COM's Area Health Education Centers--AHEC, University Medical Associates, OU Therapy Associates (speech-language pathology, audiology, physical therapy) and Athletic Training.

List of Cognate Institutions with Similar Programs

- Idaho State University
- Southern Illinois University
- University of Alabama
- University of North Dakota

Specific Institutional Goals for Each Center

The Center will leverage the university's demonstrated capacity for interdisciplinary, translational bioscience research, excellence of its health professions education, and its dedication to providing informed health care to rural and underserved populations. The Center of Excellence will have three foci: translational and clinical research, innovations in health education, and community health services, with particular emphasis on rural/underserved populations. This emphasis on the rural community is in part due to Ohio University's location in Appalachian Ohio, which is characterized by higher poverty and limited access to health care.

The core objectives of the Center of Excellence are:

Economic Impact (Outputs)

- Graduates placed in their field in the state. This metric will be tracked for medical students, and nursing students, speech-language pathologists, audiologists, physical therapists, and athletic trainers because a major objective of these programs is medical care and rehabilitation services that impact workforce development for the local underserved region.
- License income
- Patients served. The number of patients served (as measured by encounters) through the various clinical outreach programs will be tracked.

Health Impact

- Number and types of patients served annually via Community Health Programs, OU-COM's Area Health Education Centers--AHEC, University Medical Associates, OU Therapy Associates (speech-language pathology, audiology, physical therapy) and Athletic Training.
- Proportionate decrease in the number of Medically Underserved Areas (MUA) and Health Professional Shortage Areas (HPSA) in thirteen rural southeast Ohio counties that comprise the primary area served by the Ohio University AHEC program (Athens, Belmont, Gallia, Harrison, Jackson, Jefferson, Lawrence, Meigs, Monroe, Morgan, Noble, Vinton, Washington).
- Track Ohio's health profile (incidence and prevalence) to monitor long-term trends (see, Appendix III.C)
- Number of individuals with mental illness served in the community, e.g., through OU's Psychology and Social Work Clinic, and via the children's mental health network-Integrating Professionals for Appalachian Children (IPAC).
- Number of participants in community health research projects and associated funding.
- Number of community wellness and service projects, e.g., Respite Care, Kids on Campus, the Wellness Center.

Development Plan for Sustainability

In 2005, Ohio University designated a broad coalition of researchers tackling fundamental issues translational bioscience and clinical research as a major research priority. The selection process included internal, as well as external review by experts in the field. The initiative received a commitment of \$8 million in funding for six years, with annual funding predicated on annual reviews and achievement of stated milestones and metrics.

The designation of this initiative as a priority has allowed the University to strategically allocate internal resources and funding towards biomedical and biotechnological sciences, bioengineering, and the applications of

those fields. As part of the initiative, the University hired and/or provided start up for five faculty members, supplementing the usual departmental selection process, and allocated tuition stipends for more than 90 graduate students.

The University also prioritized this area for federal appropriation requests, receiving more than \$917,000 for clinical research and outreach programs, and capital projects. The Porter Addition, approximately 18,000 square feet and costing \$7 million, was a significant investment, creating state-of-the-art research and teaching spaces for the environmental and plant biology and psychology departments. In winter 2010, the Academic Research Center (ARC), totaling more than 87,000 square feet, will open. The Office of Development and the Colleges solicited and received more than \$20 million from private and foundation donations to build the ARC with the vision of supporting interdisciplinary research at Ohio University, leading to new technologies, diagnostics, therapeutics, and treatment paradigms. It is important to note that the University made a significant commitment to both of these construction projects in difficult financial times, reprioritizing capital funds of other major pending construction projects on the main campus.

In the future, the University will ensure sustainability of the Center of Excellence by the creation of an Academic Health Center (AHC). The AHC will be composed of the College of Osteopathic Medicine and a College of Health Sciences and Professions and will have affiliated faculty representing clinical, academic and research areas of health in the other Ohio University academic units as well. The AHC will work to coordinate the overall health care delivery within the University, align efforts with area and community health providers and serve as the nexus under which health- and bioscience-related research efforts will be coordinated.

OHIO UNIVERSITY

University System of Ohio Centers of Excellence Proposals





Center of Excellence Proposal for the Scripps College of Communication

The Scripps College of Communication at Ohio University is exceptional in the state and the nation because of its combined breadth and excellence. It is home to professional programs, engineering-based fields of study, humanistic and social scientific disciplines, and applied arts. It is forward-thinking, adapting its curricula, research priorities and industry partnerships to technological, economic and social changes. And to a unique degree, each of its programs is outstanding.

Its graduates are well rounded. With their skills and knowledge, they are helping to build the infrastructure necessary for the state of Ohio's future economic development. They enter a variety of fields that are typically not classified as communication (management and business, engineering and technology, computer services) that require a range of communication competencies. These graduates are prepared to adapt to organizational, market and technological changes, and to work on virtual and cross-disciplinary teams. They contribute to the story that the state of Ohio has to tell and they know how to tell its stories.

In its curricula and research, the Scripps College integrates the three key facets of modern communication: content creation, the delivery of content, and changing interfaces between content and users. This synthesis creates a college that is exceptionally strong in many areas of communication, and fosters interdisciplinary collaboration across the fields of communication to a very high degree.

The IUC provosts recommended "A Center of Excellence should be a defining niche for its institution. For example, the London School of Economics is a defining niche of the University of London."¹ The Scripps College is a defining niche for Ohio University. It is a known brand—and an increasingly strong one—with a national and international reputation. That reputation, earned as a result of the quality of its faculty, students and alumni, and the work that they do, makes the college an important contributor to the future economic well being of the state and the national and international standing of higher education in Ohio.

1. CENTER OF EXCELLENCE CONCEPT

The Scripps College of Communication is a multi- and interdisciplinary organization devoted to the study and practice of communication in all its many forms. The college is comprised of five schools (Communication Studies, Information & Telecommunication Systems, Journalism, Media Arts & Studies, and Visual Communication) and the WOUB Center for Public Media. The college enrolls approximately 2,500 undergraduate and 250 graduate students, employs more than 90 full time faculty members, and has a staff across the college, schools, and WOUB of nearly 100. The Scripps College is larger and more comprehensive in its offerings than most of its nationally recognized peers. The University of Southern California's Annenberg School for Communication, for example, is comprised of two large units—a school of communication (roughly equivalent to the Scripps College's School of Communication Studies) and a school of journalism. Annenberg enrolls about 1,400 undergraduate and 500 graduate students, and employs approximately 70 full time faculty. The University of Tennessee's College of Communication and Information is home to four schools, 1,600 undergraduate and 300 graduate students, and 50 faculty members. The University of Kentucky's College of Communication and Information Studies has three schools, 1,200 undergraduate and 300 graduate students, and 50 faculty members.

Few colleges of communication cover as broad a range of study as the Scripps College.

¹ Robert Frank, IUC Provosts Committee, "Centers of excellence: IUC provosts' recommendations" (June, 2008).

Some universities have good schools of journalism, but weak departments of communication studies (e.g., the University of Florida); others have strong programs in media production, but mediocre programs in visual communication (e.g., Syracuse University); others have good emphases in communication and rhetorical theory, but poor concentrations in mass communication research (e.g., Purdue University). And where strong programs across the various fields of communication are found, they are rarely housed together (e.g., Northwestern University's well regarded Medill School of Journalism and the highly ranked programs in its School of Communication are completely separate).

The Scripps College measures up well against the best colleges and universities in the nation on a wide variety of measures. For example, according to U.S. News and World Report's most recent rankings of "National Universities", the Scripps College's 91% *retention rate* would place it 54th in the nation, just behind George Washington University and tied with Case Western Reserve for the highest retention rate in the state of Ohio. The Scripps College's *actual graduation rate* (six year) of 86% would rank 32nd in the nation, just behind Carnegie Mellon University with Case Western Reserve as the only university in the state of Ohio in the top 50 at 44. And the Scripps College's 57% *yield rate* would place it 12th in the nation, just behind Columbia University with Ohio State as the next highest in the state of Ohio at 26.²

2. SCOPE OF ACTIVITIES

The University System of Ohio Centers of Excellence guidelines indicate that "viable candidates for recognition as Centers of Excellence, should possess the following attributes:" people (outstanding faculty and students); technology (innovations); capital (outside sources of investment). And the guidelines go on to note "successful graduate programs are most often associated with academic Centers of Excellence." The Scripps College of Communication has been selected by Ohio University as one of its Centers of Excellence, because it possesses each of these attributes.

People. Faculty members in the Scripps College are among the most accomplished and celebrated in the fields of communication. In the past two years alone, college faculty have garnered 15 prestigious national awards and held 10 journal editorships. Students in the college are also outstanding: In the past two years Scripps College students have received more than 75 national awards and recognitions, and 21% of all Honors Tutorial students are Scripps College students. Upon graduation, Scripps College students typically build successful careers and an uncommon number of them become some of the most successful people in America. Examples of living alumni include: Roger Ailes, President of Fox News; Matt Lauer, host of the Today Show; Dick Brown, former President and CEO of Electronic Data Systems; Andy Alexander, Ombudsman for the Washington Post; Steve Schoonover, President and CEO of Cellxion; Dwight Ferguson, President and CEO of Eurofresh; Paula Shugart, President of the Miss Universe Organization; Van Gordon Sauter, former President of CBS News; Joel Berman, former President of Paramount Television; Randall Winston, executive producer of *Scrubs*; Perry Sook, President and CEO of Nexstar Broadcasting.

Technology. The Ohio Department of Development has made the point that information technology is *the* "critical enabling technology" of each of the five focus areas in this year's Third Frontier Funding Opportunities. And the Scripps College is heavily invested in both teaching and research in information technology. Three years ago, the college established a new cross-disciplinary major in multi-media that initially enrolled 20 students. This past year there were 120 multi-media majors. Those students are studying at the leading edge of information content creation, delivery, and interface design. Their academic work also requires experiential learning, a hallmark of the Scripps College: last year 245 Scripps College students worked in internships and 153 of them were in the state of Ohio. Many of those students are also employed in the college's research efforts. Last year

² Best colleges 2009, average freshmen retention rate, *U.S. News & World Report* (2009), [http://colleges.usnews.rankingsandreviews.com/college/national-freshmen-least-most-likely-return: National; USNWR 2009: Looking at the Data XXII \(6-Year Graduation Rates\), College Confidential, http://talk.collegeconfidential.com/college-search-selection/598945-usnwr-2009-looking-data-xxii-6-year-graduation-rates.html](http://colleges.usnews.rankingsandreviews.com/college/national-freshmen-least-most-likely-return: National; USNWR 2009: Looking at the Data XXII (6-Year Graduation Rates), College Confidential, http://talk.collegeconfidential.com/college-search-selection/598945-usnwr-2009-looking-data-xxii-6-year-graduation-rates.html); Most popular colleges: National Universities, *U.S. News & World Report* (2009), <http://www.usnews.com/articles/education/best-colleges/2009/01/26/most-popular-colleges-national-universities.html>

the college's Game Research and Immersive Design (GRID) Lab received a \$1,300,000 grant through the Department of Homeland Security to digitize top terrorist targets in Columbus. More than 30 students are employed on this project and another \$2,000,000 proposal for expanding this research effort was submitted in June. The Scripps College is well positioned to be a national leader in interactive virtual environments generally, and immersive video imaging in particular.

Capital. The largest capital investment received by the college came in the form of a \$15,000,000 gift from the Scripps Howard Foundation in 2006 that resulted in the naming of the college. This fund supports programming in the college, including a \$3,000,000 endowment to support the establishment of an Innovation Center that will fund collaborative research projects among faculty and students that are meant to lead changes in the communication field and industry. Alumni and friends have also invested heavily in the college. In 2008-2009, the college received more than \$10,000,000 in private gifts, including \$7,500,000 from Steve and Barbara Schoonover to help build a new, integrated facility for the college that will bring together each of the five schools into one place on campus (the old Baker Center site), \$500,000 from Roger Ailes in support of the building project, and more than \$1,500,000 in new scholarship money for students in the Scripps College. And the college has also enjoyed a great deal of success in obtaining grants and contracts in recent years, including the \$1,300,000 contract from the Department for Homeland Security, a \$600,000 NIH grant, a series of grant contracts with Bangkok University in Thailand that generate more than \$450,000 for the college every three years, \$500,000 through a Workforce Innovation and Regional Development award, two contract partnerships with the Ohio Board of Regents, and \$500,000 to date as a partner in a consortium that was awarded the three-year USAID global contract for health and development communication in 2007. The college is leading the consortium's efforts to improve the communication capacities of government and non-government agencies and private sector organizations to combat HIV/AIDS, malaria and other diseases in many countries in the developing world. The focus on the role of communication in improving health care links the Scripps College as a center of excellence to a second center of excellence being proposed by Ohio University in the area of healthcare in rural and underserved communities.

Graduate Programs. Ohio University recently conducted a comprehensive review of all of its 88 graduate programs. Every one of the five graduate programs in the college eligible for review was judged to be "very good" (the MCTP in Information and Telecommunication Systems, being less than five years old, was put in the "new or developing" category. Nearly a full quarter of the 21 strongest graduate programs in the university, as assessed by this review, were programs in the Scripps College. Perhaps most impressively, only six of the 88 reviewed graduate programs received the highest rating for "external recognition" and three of those are in the Scripps College ("external recognition" being, arguably, the most important metric for proposed centers of excellence). One of those programs is the Ph.D. in Communication Studies. The most recent rankings of the National Communication Association—the largest academic association in the field of communication—placed all three of the emphases offered in the Ph.D. program in the top 20 nationally, with two of those three (organizational communication and health communication) in the top 10.

3. PROSPECTS FOR DRIVING ECONOMIC ADVANCEMENT

The Scripps College's prospects for driving economic advancement are based on the following factors:

- Developing skills in entrepreneurship, strategic thinking and business problem-solving;
- Building communications infrastructure in Ohio
- Multi-platform content creation
- Developing interactive digital technology and video games
- Communication training, support and consulting for Ohio companies and government agencies

Communication Industries: Global, National and Regional Trends

Ohio's communication and information industries are driven by national and global factors including technological innovation, media convergence, changing audience usage patterns, business investment, and advertising expenditures. The global media industry (advertising, broadcasting and cable television, publishing,

movies and entertainment) grew by 3.1 per cent in 2008 to reach a value of \$938.9 million, according to Datamonitor, a business information company that analyzes over 10,000 companies in 2,500 industries in 50 countries. By 2013, the global media industry is forecast to grow to \$1,104.2 billion, an increase of 17.6 per cent over 2008.³ The North American Industry Classification System (NAICS) rates the information sector as one of recently increased importance.⁴ Industries within the sector turn information into a commodity, disseminate that commodity and provide other information services. Although telecommunications is the largest portion of this sector, other areas include publishing industries (including online publishing), data processing, motion picture and sound recording, and broadcasting. The Ohio Department of Job and Family Services predicts a 17.8 per cent growth in jobs in computer and mathematical occupations from 2006 to 2016, with about 4,500 annual openings, and a 5.3 per cent growth in jobs in arts, design, entertainment, sports and media, with about 2,500 annual openings.⁵ Although new companies in this sector have a statistically lower survival rate than those in other sectors, the NAICS found that the information sector maintains stronger employment growth than both the education and health service sectors.⁶ Globally and nationally, most current and expected growth is in online media, mobile, interactive digital media, video games and the technological infrastructure and networks to support these applications—all areas in which the Scripps College of Communication has curricula, faculty expertise, research and current Ohio-based projects.

The Northeast Ohio Economic Review⁷ expects the information sector to grow 34% in the next 10 years. A NAICS study on high-technology establishments in Ohio indicates that components of the information sector, such as internet publishing and broadcasting, show steady employment growth.⁸ The number of organizations within the information industry may not be expanding rapidly, but the companies that manage to survive are sustaining their employment growth, and therefore maintaining economic stimulus within the community. Information technology is one of Ohio's 12 major technology platforms, as identified by the Battelle Report, *Positioning the State of Ohio for Economic Growth: Strategically Aligning Ohio's Research and Technology Portfolio*.

With an educational background and professional experience in content creation, delivery, and usage, Scripps College graduates are well prepared to enter a variety of fields, both within and outside communication. Recent alumni data show that 44 per cent of Scripps undergraduates have jobs in business, management and marketing, and nine per cent in a scientific field (natural science, engineering, mathematics, computer science). About one quarter take jobs in the strong growth areas of the media industries—media production, website design and writing.⁹ Many of the fields where Scripps College graduates find work are listed in the table of “Occupations with High Employment Prospects in Ohio.” These are occupations with at least 50 annual openings, paying at least \$14.85 per hour¹⁰ and requiring at least a bachelor's degree.

Factor #1: Developing skills in entrepreneurship, strategic thinking and business problem-solving

“Developing the human capital of young Americans is vital to keep America's entrepreneurial economy growing. Our future entrepreneurs and their workers need the twenty-first century skills and knowledge to create successful

³ Datamonitor, *Global Media Industry Profile*, (New York: October 2008). This represents a compound annual growth rate (CAGR) of 2.9 per cent for the 2004-2008 period.

⁴ David R.H. Hiles, "A first look at employment and wages using NAICS," *Monthly Labor Review*, December 2001, pp.22-31.

⁵ Ohio Department of Job and Family Services, Bureau of Labor Market Information (November 2008).

⁶ Amy E. Knaup & Merissa C. Piazza, “Business employment dynamics data: survival and longevity, II,” *Monthly Labor Review*, September 2007, pp. 3-10.

⁷ Team NEO, *Northeast Ohio Economic Review*, ClevelandPlusBusiness (March 2008), <http://www.teamneo.org/docs/QERMarch08web.pdf>

⁸ Daniel E. Hecker, "High-technology employment: a NAICS update," *Monthly Labor Review*, July 2005, pp. 57-72.

⁹ Ohio University Office of Institutional Research, “2005-2006 Ohio University Career & Further Education Study Comparison of Current Job Title and Academic Major Bachelor's Degree Graduates.” By contrast, only eight per cent were working in journalism.

¹⁰ \$14.85 was Ohio's median wage in May 2007. Ohio Department of Job and Family Services, Bureau of Labor Market Information (November 2008).

ventures and to spur innovation in the economy. ... The study of entrepreneurship has been largely sequestered even at the university level as an MBA specialty. ... [we need] entrepreneurial skills (e.g. opportunity-recognition and risk-taking) for all students, not just those in graduate business schools.” (Kauffman Foundation).¹¹

Although the best-known media companies, such as Disney, Time-Warner, Viacom, NewsCorp and Google, are global corporations with thousands of employees, most communication-related jobs are in small companies with less than 15 employees.¹² Many media companies, like those in other economic sectors, have trimmed their full-time workforces to reduce salary and benefit costs. This has led to the growth of small companies that subcontract to provide media products and services, including advertising, marketing, graphic design and digital post-production. For example, it may no longer be viable for a company to maintain a video studio and editing suite, with staff and equipment costs, that operates at less than 100% capacity. Instead, those services are provided by a production house that serves many clients. Digital technology has accelerated this trend, making content creation a relatively low capital investment. Online news and information sites require computers, servers and content and design staff, but not printing presses. In the music industry, most recording has moved from large, expensive studios to small computer-based operations. Digital technology and broadband have made it efficient to use subcontractors in multiple locations to create content; for example, a commercial can be shot in Cincinnati, edited in Cleveland, add a voice or music track from Columbus, and import graphic design and animation from Athens. All this can be accomplished through digital data transmission without shipping the footage. Assuming adequate broadband connections, media production services and design companies are viable in any location in the state because they do not have to move physical product. The success of companies in southeastern Ohio such as Electronic Vision and museum designer Hilferty & Associates demonstrate that this is a viable business model.

The five schools in the college are transforming curricula to prepare students for a world where they will change jobs frequently, need to adapt and learn new skills and work practices and develop their own businesses, products and services.

The Scripps College is building entrepreneurial and small business management skills into curricula. The College of Business is developing a customized minor for communication students with courses in management, business planning, marketing and business law; this will focus on key applications, such as the analysis of financial statements. Beginning in Fall 2009, the college will work with the Voinovich School and the College of Business in the new Center for Entrepreneurship. This partnership is the key element in the Internship and Cooperative Applied-learning Network (I-CAN) proposal recently submitted to the Ohio Board of Regents Ohio Co-op and Internship Program that included first-year financial commitments totaling \$317,000, about two thirds of the total coming from communication companies and organizations in Ohio. In total, including multi-year commitments, communication companies and organizations have pledged \$842,220 to this I-CAN initiative. The Center will offer undergraduate and graduate certificate programs and projects in which students work with companies in southeastern Ohio, particularly those in interactive digital technology. The college will work with TechGROWTH Ohio, which serves a 19-county region in southern and eastern Ohio under an Entrepreneur Signature Program (ESP) grant from the State of Ohio’s Third Frontier. Since 2007, TechGROWTH Ohio has actively worked with 165 companies; the largest category (28 per cent) are companies whose innovations are in interactive digital technologies (IDT). With a \$400,000 grant from Department of Labor H1B funds, we are creating, in collaboration with TechGrowth Ohio, an infrastructure for training workers in the IDT fields. We are working with two-year institutions in our assigned service area to create training materials, improve instructor training, provide direct training to students, and establish contacts with companies requiring an IDT-trained workforce, with a focus on health care companies and high-tech start-up firms.

All schools have increased the number of business-oriented courses for majors. For example, in Media Arts & Studies (MDIA), students in the *Entertainment Law and Finance* course develop proposals for new media

¹¹ Ewing Marion Kauffman Foundation, “Education and U.S. Entrepreneurship Factsheet,” <http://www.entrepreneurship.org/Resources/Detail/Default.aspx?id=18910>

¹² Small firms, those with 1 to 499 employees, create about 64 per cent of new jobs. Jessica Hefland, Akbar Sadeghi, and David Talan, “Employment dynamics: small and large firms over the business cycle,” *Monthly Labor Review* 130, no. 3 (March 2007): 49, <http://www.bis.gov/opub/mlr/2007/03/art3full.pdf>

companies and ventures with complete business plans, and present them to experienced media entrepreneurs, while the *Leadership for Media Industries* course builds management, entrepreneurship and business problem-solving skills. Enrollment in the school’s media management sequence has grown substantially in the last five years, with many students completing the Sales Certificate offered by the College of Business. Journalism is radically transforming its curriculum ahead of the 2012 quarters to semesters switch to help its graduates develop the knowledge and skills they will need in both media and non-media careers. The new curriculum abandons traditional medium-specific sequences (print, broadcast, online), and focuses on skills in information gathering, writing and delivery of content across multiple platforms. New courses will focus on strategic communication, including research and analysis, issue identification, business problem-solving and entrepreneurship. These courses will prepare students to take on positions in management, and launch their own companies, products and ventures.

Factor #2: Building Communication Infrastructure in Ohio

The School of Information and Telecommunication Systems (ITS) has an excellent track record of placing its graduates in both internships and full-time positions with Ohio companies in computer-related fields. In Ohio, the occupation of network systems/data communication analyst is predicted to be the second fastest-growing occupation in the 2006-2016 period with a growth rate of 47.9 per cent. Other computer-related fields will also show strong growth—software engineers/applications at 38.9 per cent and database administrators at 24.4 per cent. The computer systems design and related services sector is one of the 10 “high prospect” industries that are projected to create a large number of new jobs and a growth rate of at least 25 per cent, according to the Ohio Department of Job and Family Services. Although the sector ranks fifth in terms of the expected number of jobs created (13,300), its growth rate will exceed those of the top two categories—individual and family service and home health care services. In third place is management and technical consulting services (13,800). Unlike the top two categories, both computer systems design and related services and the more general management and technical consulting services require a bachelor’s degree. Of the seven non-teaching occupations with high employment prospects in Ohio requiring a bachelor’s degree, the computer-related fields rank first, second and fifth in average pay.¹³

Occupations with High Employment Prospects in Ohio, Requiring a Bachelor’s Degree¹⁴

NAICS Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average wage, May 2007	School
15-1031	Computer Software Engineers, Applications	16,440	22,840	38.9	880	\$37.29	ITS, MDIA
15-032	Computer Software Engineers, Systems Software	7,330	8,920	21.7	266	\$39.17	ITS
15-051	Computer Systems Analysts	15,490	18,680	20.6	730	\$34.21	ITS
15-061	Database Administrators	4,960	6,170	24.4	174	\$32.47	ITS
15-071	Network and Computer Systems	12,020	14,510	20.7	523	\$29.98	ITS

¹³ Ohio Department of Job and Family Services, *2016 Ohio Job Outlook Employment Projections* (December 2008)

¹⁴ Ohio Department of Job and Family Services, Bureau of Labor Market Information (November 2008).

NAICS Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average wage, May 2007	School
	Administrators						
15-081	Network Systems and Data Communication Analysts	7,970	11,790	47.9	544	\$34.32	ITS

Occupations with High Employment Prospects in Ohio, Requiring Work Experience plus a Bachelor’s or Higher Degree¹⁵

NAICS Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average wage, May 2007	School
11-3021	Computer and Information Systems Managers	8,620	9,440	9.5	221	\$51.23	ITS

ITS graduates design, build, maintain and secure sophisticated communication networks. Ohio’s major insurance companies, such as Nationwide and Progressive, which rely on communication networks for data, sales and claims, employ many ITS graduates. Others design and build data networks for the telephone companies (AT&T and Verizon), manufacturing and service companies including major retail chains with multiple store locations, and government agencies. Companies and organizations that require robust networks for business and internal and external communication realize the need to maintain staff levels and equipment in telecommunications departments. Reducing staff can damage a company’s networking capacity, putting it at a competitive disadvantage. In today’s economy, the ability to gather, track and secure data is a valued commodity. ITS addresses these needs through a series of courses on network design and maintenance. With increasing concerns about data security, the school has developed a series of courses on network and data security, and incorporated security issues in other courses.

The combination of information technology and business skills in the ITS major makes its graduates well prepared for technical and management positions in the computer systems design and related services sector. Undergraduate enrollment (both by freshmen and transfer students) has been steadily increasing as has that for the Master’s in Communication Technology and Policy. Because this is an area of economic growth for the state, we expect ITS graduates to play a growing role in Ohio’s economic future; for example, in the recent Internship and Cooperative Applied-learning Network (I-CAN) proposal, Progressive Insurance committed \$336,000 to support up to 10 students a year for the next five years.

Factor #3: Multi-platform Content Creation

Although traditional media (newspapers, magazines and broadcast television and radio) continue to experience declining advertising revenues and stock values, online media, mobile applications, interactive digital technology

¹⁵ Ibid.

and video games all showed growth and profit in 2008. The U.S. accounts for about half the global total for online advertising spending.¹⁶ In 2008, the Web surpassed all other media except television as the primary source of news for Americans.¹⁷ Global revenue from mobile content and data services is expected to increase to \$240 billion by 2012, and mobile-data traffic to grow 300-fold by 2015.¹⁸ As these numbers increase, demand for content including information, games and other applications will grow. Global sales of console hardware and games software hit a record \$49.9 billion in 2008.¹⁹ Market research firm IDC forecasts that 24 million Americans will be watching video on their mobile phones by 2010, while the European Commission estimates that mobile TV will generate global sales of \$5-7 billion by 2009. Apple sold more than 17 million iPhones in 2008, with over 500 million downloads from its “App Store” since its launch in July. At the May 2009 Mobile World Congress in Barcelona, Microsoft, the world’s largest software firm, and Nokia, the world’s largest handset maker, announced their own application stores. Research in Motion (RIM), maker of the BlackBerry, and Google, the world’s largest internet firm, have done the same.²⁰ The popularity of software downloads and the rapid growth of mobile broadband have led to forecasts of dramatic growth.

For the last decade, the college has been transitioning its undergraduate and graduate curricula, internship placements and programs to these growth areas. As faculty have left or retired, they have been replaced by new faculty with teaching and research interests in new media, including online information delivery and interactive digital technology. The college’s emerging strengths are in areas that, according to economic predictions, will experience growth and create new jobs, including several identified by the Ohio Department of Job and Family Services as “Occupations with High Employment Prospects in Ohio.” .

Occupations with High Employment Prospects in Ohio, Requiring a Bachelor’s Degree²¹

NAICS Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average wage, May 2007	School
27-1014	Multi-Media Artists and Animators	2,070	2,640	18.8	87	\$23.14	MDIA, VICO
27-1021	Commercial and Industrial Designers	2,620	2,710	3.4	79	\$24.93	VICO
27-1024	Graphic Designers	10,560	11,050	4.6	330	\$19.70	VICO, MDIA
27-3022	Reporters and Correspondents	2,480	2,380	-4.0	78	\$19.90	JOUR
27-3031	Public Relations Specialists	6,740	7,470	10.8	124	\$25.83	JOUR

¹⁶ “Not ye olde banners: Internet advertising will be relatively unscathed in the downturn,” *The Economist*, November 27, 2008.

¹⁷ Pew Research Center Project for Excellence in Journalism, *The State of the News Media 2009*, retrieved from www.stateofthemediamedia.org/2009

¹⁸ “Boom in the bust: Despite the recession, the mobile industry is enjoying a promising transformation,” *The Economist*, March 5, 2009.

¹⁹ “Play on: Video games have proved to be recession-proof—so far, at least,” *The Economist*, December 18, 2008.

²⁰ “Boom in the bust,” *The Economist*, March 5, 2009.

²¹ Ohio Department of Job and Family Services, Bureau of Labor Market Information (November 2008).

NAICS Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average wage, May 2007	School
27-3041	Editors	3,660	3,420	-6.6	109	\$22.90	JOUR
27-3042	Technical Writers	1,490	1,590	6.7	55	\$23.77	JOUR, MDIA
27-3043	Writers and Authors	3,310	3,380	2.1	67	\$23.64	JOUR, MDIA

Occupations with High Employment Prospects in Ohio, Requiring Work Experience plus a Bachelor's or Higher Degree²²

NAICS Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average wage, May 2007	School
11-2021	Marketing Managers	3,800	4,080	7.4	112	\$49.66	JOUR, MDIA, COMS
13-1073	Training and Development Specialists	7,680	8,930	13.6	276	\$24.03	COMS
27-1011	Art Directors	2,560	2,690	5.1	73	\$38.96	VICO
27-2012	Producers and Directors	1,980	2,080	5.1	69	\$28.01	MDIA
27-2041	Music Directors and Composers	2,110	2,420	14.7	74	\$39.65	MDIA

a. Online and Mobile Marketing and Advertising

In the U.S., **online media** continue to grow rapidly, capturing both general and segmented audiences and an increasing proportion of advertising revenue. Ad revenues online totaled \$23.4 billion in 2008, up 10.6 per cent from \$21.2 billion in 2007.²³ National advertising still has the largest share but over the past decade the share of Internet advertising from local businesses has doubled as local companies become more comfortable advertising on Google, Yahoo, Monster and other Internet-only sites; the national/local ratio (80-20 a decade ago) has narrowed to 70-30 and is projected to reach 60-40 by 2012.²⁴ The ads themselves are changing, as companies move away from banner ads (the online equivalent of print display ads) to search (where the consumer is presented with ads based on the term typed into a search engine) and “rich media” ads, which allow users to

²² Ibid..

²³ Pew Research Center, *The State of the News Media 2009*.

²⁴ Ibid..

interact by clicking, so their engagement can be tracked. The market research firm eMarketer projects that search advertising will continue to grow by 14.9 per cent per year, and rich media ads by 7.5 per cent. Advertising in online video (including moving and dynamic web content) was projected to grow by 44 per cent in 2008 to \$3.6 billion, up from \$2.5 billion a year earlier.²⁵ In **mobile media**, Informa, a market research firm expected U.S. advertisers to spend \$1.3 billion in 2008, up 59 per cent from 2007. Although compound annual growth is expected to slow to 34 per cent (resulting in \$3.6 billion in 2012), the mobile sector will be the fastest growing of all advertising media in the U.S..²⁶

Two of the School of Visual Communication's (VICO) sequences—in publication design and interactive multimedia—prepare students to create and deliver visual marketing and advertising content across multiple platforms, including online, mobile, broadcast and print. For some retailers, online sales now outstrip in-store sales, requiring employees with the skills to design and package content for online customers; Midwest Photo in Columbus, which started with a High Street store and mail-order business, is now one of the top photo retailers in the U.S., with 80 per cent of its business online. VICO graduates have also helped Stewart MacDonald, a southeastern Ohio musical instrument and supply company, create the visual content to build a worldwide online sales business. Regional medical facilities, such as Holzer and O'Bleness, employ VICO graduates to design information and marketing tools for multiple platforms. In Journalism, the new curricular focus on strategic thinking and integrated marketing communication is replacing traditional advertising and public relations courses; students learn how to conduct campaigns across multiple media, rather than study medium-specific practices. Industry and research expertise comes from such faculty as Craig Davis, who managed online advertising accounts for Saatchi & Saatchi, Hong Cheng, an authority on mobile ads in the global economy, and Carson Wagner, who conducts research on consumer behavior.

b. Online News and Information

The focus of the schools of Journalism and Visual Communication on online news reflects rapid and significant shifts in the way Americans look for news. According to a survey by the Pew Research Center's Project for Excellence in Journalism, 2008 was the year when the Web surpassed all other media except television as "a source for national and international news." The top 50 news websites saw traffic grow by 27 per cent, while all 700 news and information sites monitored grew seven per cent. The top four news sites—Yahoo, MSNBC.com, CNN.com and AOL—saw average unique monthly visitors grow 22 per cent to 132 million, twice the rate of increase for 2007.²⁷ In many markets, journalists already work in converged newsrooms, reporting for broadcast TV, radio newspapers, online media and—for specialty news and information—mobile media. Technological convergence requires today's journalists to apply information gathering, reporting and writing skills in multiple platforms. Journalism has restructured its reporting and writing courses to incorporate audio, video and online reporting in addition to the traditional print emphasis. It has moved away from a medium-specific emphasis on radio news to providing audio information—including long-term news features and sports—for streaming, podcasts and mobile. In the major growth area of subscription satellite radio where news and talk formats are highly specialized, the school is offering coursework. New faculty joining the school in Fall 2009 specialize in online news delivery and the economics and business models for online news.

Visual Communication's photo journalism sequence was the first in the U.S. to make the transition from analog to digital in 1998. Today, courses in audio recording, video shooting, graphic design and post-production enable VICO students to work across multiple media in addition to their foundations in still photography. Digital media and the Internet have radically transformed how photojournalists do their jobs; instead of shooting, returning to the office, processing pictures and then editing, a photojournalist can perform all tasks on location, with the picture editor reviewing in real time. Digital media have encouraged innovation in online content creation and delivery. In 2006, VICO launched the online magazine, Soul of Athens, www.soulofathens.org which

²⁵ Ibid. and "Not ye olde banners," *The Economist*, November 27, 2008.

²⁶ Pew Research Center, *The State of the News Media 2009*.

²⁷ Pew Research Center, *The State of the News Media 2009*.

incorporates video, stills, and audio and interactive user functions. This year's edition, launched on June 1, attracted 3,617 unique visitors and over half a million hits on the first day. VICO and Journalism are now planning to launch a weekly online news magazine, *Community Report*, with local news, features and sports. Revenue will come from local advertisers, a business model that can be used in other Ohio communities by existing news organizations or new ventures; faculty are also investigating the viability of an I-tunes pay-per-download model.

Factor #4: Developing Interactive Digital Technology and Video Games

In southern and eastern Ohio, companies developing interactive digital technology and video games are a key focus for the Voinovich School's TechGROWTH Ohio, a \$15 million program funded by the State of Ohio's Third Frontier, Ohio University and Wesbanco. Of the 165 companies in a 19-county region with which TechGROWTH Ohio has worked since its launch in 2007, 28 per cent have innovations in interactive digital media. The program is measured by its ability to use state dollars to leverage additional investments; through April 2009, the program achieved a leverage ratio of \$3.16 to \$1.00. To date, the total value of metrics achieved is almost \$10 million—with 30 per cent for companies working in interactive digital media. In the Scripps College, TechGROWTH Ohio has worked with the Games Research and Immersive Design (GRID) Lab to develop business plans and commercialization pathways for several projects, both those based on staff research and student projects.

The GRID Lab focuses on the research and development of serious games with applications in areas from homeland security to education to health. Its first major project was to produce the Owens Community College CEPsim - Fire and Police Training Center for Homeland Security. This is a series of instructional scenarios and props that allows first responders to apply theoretical knowledge gained in classroom seminars to practical real life simulations in a controlled and safe environment. The scenarios in the game provide first-tier basic police, fire, and emergency medical training to allow first responders to work jointly through simulated disasters and emergencies.

Based on this experience, the GRID Lab won a \$1,300,000 grant to create interactive digital environments of 60 high-profile Columbus buildings or sites that could be most susceptible to terrorist attacks, hostage situations or other critical incidents. Funding comes from the Urban Area Security Initiative Terrorism Early Warning Group, a unit of the Columbus, Ohio, Division of Police. To build accurate models of the sites, Ohio University team members are employing new technologies such as 360-degree photography and photogrammetry. Each virtual model will contain embedded information about a facility's history, owner, utility service providers and contacts. The group is also developing software and hardware that allows first responders to access the data and models on wireless-enabled laptops, whether at a precinct or in the field. After successful presentation at the national Urban Area Security Initiative Conference this month (June 2009), six cities (three in Ohio) have contacted the GRID Lab about expanding the project to include their city.

In education, the GRID lab has been integral in the development and user testing of an educational algebra game that imbeds algebra challenges in the game context. Under contract to game developer Tabula Digita, the GRID Lab tested whether playing the game can improve math skills. Among the research results:

- “Students who played the math video games scored significantly higher on the district-wide math benchmark exam, $F(1, 188) = 6.93, p < .05$, and on the math performance test generated by the publisher, $F(1, 188) = 8.37, p < .05$, than students who did not play the games.
- While students in both the experimental and control groups demonstrated significant gains from pre-test to posttest on the district benchmark exams, students who played the games demonstrated greater gain scores from pre-test to posttest (mean increase of 8.07) than students who did not play the games (mean increase of 3.74).
- Higher achievement scores and greater gain scores on district benchmark tests by students who played the games, compared to those who did not play the game are particularly significant because there is a high correlation between the district math benchmark tests and the statewide math FCAT tests (as reported by the district).

- Teacher and student interviews support the quantitative findings. The majority of the interviewed teachers (4 of 5) and students (15 of 15) reported that the participants' mathematics understandings and skills improved as a result of playing the mathematics games.
- According to the teachers, the games were effective teaching and learning tools because they were experiential in nature, (b) offered an alternative way of teaching and learning, (c) gave the students reasons to learn mathematics to solve the game problems and progress in the games, (d) addressed students' mathematics phobias and (e) increased time on task. As one of the teachers stated: "It [the games] makes them want to learn [math]."²⁸

As part of an NIH- and USDA-funded project to teach science and math concepts through food, the GRID Lab completed the FOODMaster online component²⁹. The GRID Lab is collaborating with a renowned diabetes clinician (Dr. Frank Schwartz, M.D., James O. Watson Endowed Diabetes Research Chair at Ohio University's College of Osteopathic Medicine) to use mobile gaming technology to educate youth with type 1 diabetics how to effectively monitor their glucose level and program their insulin pumps appropriately in response. A research and development proposal is currently under review by the Robert Wood Johnson Foundation,

The GRID Lab is preparing a proposal to *create an on-line, interactive planning tool for high school seniors illustrating various paths for completing a college degree in Ohio*. This will not be a mock-up. It will be a functioning prototype utilizing data sets from Ohio University, allowing a theoretical High School Senior to successfully strategize her way to a college degree. The tool could also be utilized by a college student to plan the remainder of her degree requirements. Several student-initiated projects are also in development, including Financially Correct, a game designed to teach high school and college students how to manage personal finances.

Graduate and undergraduate students from Media Arts & Studies, Visual Communication, Journalism, Communication Studies, and Information & Telecommunication Systems are actively involved in these and other game development projects. In the three years since Media Arts & Studies launched its sequence in Digital Media: Special Effects, Games and Animation, enrollment has increased sixfold—from 20 to 120 students. The specialized sequence includes courses in 2 and 3D animation, interface design, producing and video games production.

Factor #5: Communication training, support and consulting for Ohio companies and government agencies

Faculty from all schools, often working with undergraduate and graduate students, frequently conduct campus and on-site workshops, on-the-job training and consulting for Ohio companies, non-profit groups and government agencies. These include:

- Consulting for State of Ohio computer networks and Ohio Supercomputer Center (Information and Telecommunication Systems and GRID Lab)
- Consulting for NASA Glenn Research Center, Cleveland (Information and Telecommunication Systems)
- Workshops for the Ohio Newspaper Association on new media and video and online production and delivery for small-town and community newspapers (Journalism)
- Layout and digital design workshops for Ohio metropolitan newspapers (Visual Communication)
- Design consulting for major retailers, e.g. Abercrombie & Fitch (Visual Communication)

²⁸ Mansureh Kebritchi, Ph.D., Atsusi Hirumi, Ph.D. and Haiyan Bai, Ph.D. 2008. Research Brief: The Effects of Modern Math Computer Games on Learners' Math Achievement and Math Course Motivation in a Public High School Setting http://www.dimensionm.com/docs/UCFResearch_Brief_June_202008.pdf

²⁹ See <http://www.foodmaster.org/index.aspx>

- Scripps Survey Research Center research for hospitals, school district and state and local government agencies
- Apple certification in video editing and post-production applications (Media Arts and Studies)
- Survey research for City of Athens, Tri-County Mental Health and Counseling Services, Athens County Convention and Visitors Bureau, Nelsonville Chamber of Commerce, Southeast Ohio Legal Services and other agencies (Communication Studies)
- Development of Web-based and print communications and marketing materials for regional companies, including as boot and shoe manufacturer Rocky Boots, musical instrument and supply company Stewart McDonald, museum designer Hilferty and Associates, and digital media company Electronic Vision, and social service agencies such as PassionWorks, an arts studio for individuals with development disabilities (Communication Studies and Visual Communication)
- Workshops and consulting for Ohio local historical society and museum staff and archivists through Ohio Humanities Council, Ohio Historical Society and Ohio Association of Historical Societies and Museums (Media Arts and Studies)

4. FACULTY MEMBERS ASSOCIATED WITH THE CENTER

Communication Studies

Stocker Professor of Communication: **William K. Rawlins**, Ph.D., *Temple U.*

Schoonover Professor of Communication: **Lynn Harter**, Ph.D., *U. of Nebraska*

Zumkher Professor of Communication: **Raymie E. McKerrow**, Ph.D., *U. of Iowa*

Prof: **Roger Aden**, Ph.D., *U. of Nebraska*; **Austin Babrow**, Ph.D., *U. of Illinois*; **Christina Beck**, Ph.D., *U. of Oklahoma*; **Pamela Benoit** (provost), Ph.D., *Wayne State University*; **William Benoit**, Ph.D., *Wayne State University*; **Tom Daniels**, Ph.D., *Ohio U.*; **David Descutner**, Ph.D., *U. of Illinois*; **Elizabeth Graham**, Ph.D., *Kent State U.*; **Claudia Hale** (director), Ph.D., *U. of Illinois*; **Judith Yaross Lee**, Ph.D., *U. of Chicago*; **Gregory J. Shepherd** (dean), Ph.D., *U. of Illinois*.

Assoc. Prof: **Anita James**, Ph.D., *U. of Southern California*; **Jerry L. Miller**, Ph.D., *U. of Oklahoma*; **J. Webster Smith**, Ph.D., *Wayne State U.*; **Scott Titsworth**, Ph.D., *U. of Nebraska*.

Asst. Prof: **Benjamin R. Bates**, Ph.D., *U. of Georgia*; **Laura Black**, Ph.D., *U. of Washington*; **Jennifer Bute**, Ph.D., *U. of Illinois*; **Devika Chawla**, Ph.D., *Purdue U.*; **Andrew Ledbetter**, Ph.D., *U. of Kansas*; **Mirit Shoham**, Ph.D., *U. of California*; **Daniel West** (Cassese Director of Forensics), M.A., *Texas State U.*

Information and Telecommunication Systems

Prof: **Phyllis W. Bernt**, Ph.D., *U. of Nebraska*; **Hans Kruse**, Ph.D., *Vanderbilt U.*; **Andrew Snow**, Ph.D., *U. of Pittsburgh*.

Assoc. Prof: **Philip Campbell** (director), M.S., *SUNY, Stony Brook*; **John Hoag**, Ph.D., *Ohio State U.*; **Herbert Thompson**, Ph.D., *U. of Georgia*.

Asst. Prof: **Julio Arauz**, Ph.D., *U of Pittsburg*; **Anthony G. Mele**, B.S., *Ohio U.*; **Lawrence E. Wood**, Ph.D., *Pennsylvania State U.*

Journalism

Prof: **Joe Bernt**, Ph.D., *U. of Nebraska*; **Anne Cooper–Chen**, Ph.D., *U. of North Carolina*; **Marilyn Greenwald**, Ph.D., *Ohio State U.*; **Robert Stewart**, Ph.D., *U. of Washington*; **Michael Sweeney**, Ph.D., *Ohio U.*; **Patrick Washburn**, Ph.D., *Indiana U.*; **Patricia Westfall**, M.S., *Columbia U.*

Assoc. Prof: **Bojinka Bishop**, M.S., *U. of Michigan*; **Hong Cheng**, Ph.D., *Pennsylvania State U.*; **Eddith Dashiell**, Ph.D., *Indiana U.*; **Bernhard Debatin**, Ph.D., *Technical U., Berlin*; **Sandra Haggerty**, B.S., *Utah State U.*; **Thomas Hodson** (director), J.D., *Ohio State U.*; **Hugh Martin**, Ph.D., *Michigan State U.*; **Thomas Peters** (part time), M.B.A., *Ohio U.*; **Ron Pittman**, M.S., *Marshall U.*; **Mary Rogus**, M.B.A., *U. of Kentucky*.

Asst. Prof: **Orvil Patricia Cambridge**, Ph.D., *Ohio U.*; **Craig Davis**, M.A., *Duquesne U.*; **Aimee Edmondson**, Ph.D., *U. of Missouri*; **Cary Frith**, M.S., *Ohio U.*; **Ellen Gerl**, M.S.J., *Ohio U.*; **Kevin Grieves**, ABD, *Indiana U.*; **Michelle Honald**, Ph.D., *U. of Oregon*; **Yusaf Kalyango**, Ph.D., *U. of Missouri*; **Hans Meyer**, ABD, *U. of Missouri*; **Bill Reader**, M.A., *Pennsylvania State U.*; **Carson B. Wagner**, Ph.D., *U. of Colorado*.

Scripps Howard Visiting Professional: **Mark Tatge**, M.A., *Ohio State U.*

Visiting Professional: **Tom Suddes**, M.S., *Ohio U.*

Media Arts and Studies

Prof: **Vibert Cambridge**, Ph.D., *Ohio U.*; **Don Flournoy**, Ph.D., *U. of Texas*; **W. Stephen Howard** (director, African Studies), Ph.D., *Michigan State U.*; **Drew McDaniel**, Ph.D., *Ohio U.*; **David Mould** (associate dean), Ph.D., *Ohio U.*; **Norma Pecora**, Ph.D., *U. of Illinois*; **Karen Riggs**, Ph.D., *Indiana U.*; **Josep Rota**, Ph.D., *Michigan State U.*; **Joseph Slade**, Ph.D., *New York U.*

Assoc. Prof: **Duncan Brown**, Ph.D., *U. of Illinois*; **Charles Clift III** (emeritus, part time), Ph.D., *Indiana U.*; **Mia Consalvo** (graduate director), Ph.D., *U. of Iowa*; **Roger Cooper** (director), Ph.D., *Indiana U.*; **Arthur C. Cromwell**, Ph.D., *Ohio U.*; **Roger Good**, M.A., *Ohio U.*; **George Korn**, Ph.D., *Southern Illinois U.*; **Frederick Lewis**, M.F.A., *Brown U.*; **Jenny Nelson**, Ph.D., *Southern Illinois U.*; **Greg Newton**, Ph.D., *Indiana U.*; **Rafael Obregon** (director, Communication & Development Studies), Ph.D., *Pennsylvania State U.*; **Jeff Redefer** (associate director), M.A., *Ohio U.*; **Karin Sandell** (emerita, part time), Ph.D., *U. of Iowa*.

Asst. Prof: **Eddie Ashworth**, M.A., *Ohio U.*; **Pamela Chikombero**, Ph.D., *Kent State U.*; **Casey Hayward**, M.F.A., *Savannah College of Art and Design*; **Beth Novak**, M.F.A., *Ohio State U.*; **Eric Williams**, M.F.A., *Columbia U.*; **Lawrence E. Wood**, Ph.D., *Pennsylvania State U.*

Instr: **John Bowditch**, M.A., *Ohio U.*

Visual Communication

Prof: **Terrill Eiler** (director), M.F.A., *Ohio U.*; **Marcia Nighswander**, B.S.J., *Bowling Green State U.*

Assoc. Prof: **Stanley Alost** (assistant director), M.S., *Ohio U.*; **Samuel Girton**, M.F.A., *Ohio U.*; **Larry Hamel–Lambert**, M.A., *Ohio U.*; **Gary Kirksey**, M.A., *Ohio U.*; **Terence Oliver**, M.A., *Ohio U.*; **William R. Schneider**, M.F.A., *Ohio U.*

Asst. Prof: **Julie Elman**, M.F.A., *Ohio U.*; **Rebecca Schmehl**, M.A., *Syracuse University*; **Peter Souza**, M.S., *U. of Kansas*.

5. GRADUATE PROGRAMS ASSOCIATED WITH THE CENTER

Master's:

Master of Science in Journalism

Master of Arts in Media Arts and Studies

Master of Arts in Visual Communication

Master of Communication Technology & Policy in Information and Communication Systems

Master of Arts in International Affairs in Communication and Development Studies (joint program with Center for International Studies)

A new master's in Communication Studies, targeted to working professionals in Central Ohio, will admit its first cohort this fall.

Doctoral:

Communication Studies

Mass Communication (through Journalism or Media Arts & Studies)

The results of the most recent (2004) doctoral program reputational study conducted by the National Communication Association (the largest academic association for communication scholars) ranked two of the three areas in the Ph.D. in Communication Studies in the top ten nationally, with the third ranked in the top 20.

Health Communication was ranked 9th in the nation.

Organizational Communication was ranked 10th in the nation.

Rhetorical Communication was ranked 18th in the nation.

The Master of Communication Technology and Policy Program in Information and Telecommunication Systems – known for its triple focus on technology policy and strategic management – recently was singled out for a Program of Excellence Award from the International Telecommunications Education and Research Association (ITERA).

Scripps College has almost a quarter of the 21 strongest graduate programs in the university, according to the 2008-2009 review of all graduate programs. The highest rating for "external recognition" went to only six programs--three from the Scripps College.

6. PROFESSIONAL PROGRAMS ASSOCIATED WITH THE CENTER

WOUB Center for Public Media

The WOUB Center for Public Media at Ohio University provides public broadcast services, student professional development, and non-broadcast educational services. The Center's resources support the university's public service, teaching, research, and administrative missions, through public radio, public television and related and developing technologies. Through these activities, the Center extends the intellectual resources of the University to its broader community.

The Center operates one AM and five FM (the WOUB Radio Network) radio stations; two public television stations, WOUB-TV and WOUC-TV; and one cable channel, WOUB II. Multicast channels provide six distinct content streams. Including delivery by cable systems and direct broadcast satellite services, radio and television services cover over 50 counties throughout the region. WOUB offers real-time streamed radio programming of the WOUB Radio Network, on-demand radio programming (music, public affairs), on-demand local and national public TV programming, media and news content via Twitter updates, and podcasts via iTunes RSS feed.

WOUB serves as a laboratory and training ground for nearly 300 Ohio University students each year in media production for online, television and radio news in areas such as sports, public affairs and educational programming. The WOUB Student Professional Development Program provides hands-on experience and mentoring for student and community volunteers through professional staff and a fully-equipped broadcasting facility in areas such as media operations and production, graphics and editing, traffic operations, engineering, community outreach, and teleconferencing. Efforts are underway to integrate and align the program's professional development activities with the college's curricula to provide academic credit for professional development experiences.

WOUB operates and provides technical and logistical support for the Ohio University Learning Network (OULN) which offers Athens-campus courses to all 7 Ohio University campuses and centers via a compressed video network (IP and ISDN connectivity), as well as Lorain County Community College, Kent State University, University of Akron, The Ohio State University, Columbus State Community College and its satellite locations, Youngstown State University, Zane State Community College, and Cleveland State University, and professional sites such as Berger Hospital and the Computer Workshop. By combining students from several campuses, classes that would not have enough students on a single campus can meet enrollment targets. This has broadened the range of courses available to regional campus students and businesses.

Local television productions include the award-winning *Newswatch* each weeknight and the three-time Emmy Award-winning *Gridiron Glory*. At the June 2009 Ohio Associated Press Broadcast Awards, WOUB took first place in the small market Enterprise Reporting and first place in the small market Best Documentary categories.

In collaboration with osteopathic medical professionals, including those from Ohio University's College of Osteopathic Medicine, WOUB provides health education to radio and web audiences around the world. *Family Health*, a two-minute daily broadcast, is aired by over 250 stations worldwide, including the Armed Forces Radio Network, and over 30,000 regular listeners via the web, iTunes, and podcast.

WOUB is deeply involved in community and educational outreach activities in the region. In the last reporting year, it held 67 Pre-K Teacher Professional Development workshops (the average for all stations in the \$5-\$7 million budget range was 9.22), with 930 participants. Other workshops attracted 125 participants.³⁰ Examples of WOUB outreach using technology include:

Parenting Counts---Collaboration with family services Help Me Grow programs in Ohio to enhance caregiving skills for disadvantaged children. WOUB is only one of eight public TV stations nationwide chosen to work with Talaris Institute on this service program, which combines workshops, home visits, and media instruction for parents and caregivers of preschool children.

eTech Ohio--Collaboration on Technical and Instructional Development for the production of interactive instructional programming series aligned with the state academic content standards, in consultation with the Ohio Department of Education. The programming is targeted to the needs of the poorest 200 school districts in Ohio.

eTech Ohio--Collaboration on Educational and Assistive Technology for regular classroom and special education teachers in Ohio. This project provides professional development resources that encourage educators to enhance learning by engaging students in activities that respond to their particular learning needs, strengths, and preferences.

Public Broadcasting Master's Program

The School of Media Arts and Studies and the WOUB Center for Public Media offer an MA program to women and persons of color to study public broadcasting management. The program, launched in 1981, has prepared over 100 public broadcasting professionals to return to a career with specialized skills through course work and professional work at WOUB.

³⁰ Corporation for Public Broadcasting, *Station Activities Benchmarking Study, FY 2008*.

Online Communication and Development Program

Over the last five years, the Communication and Development Studies graduate program, working with Ohio University Without Boundaries, has offered on-line non-credit courses to over 500 development agency professionals in over 30 countries worldwide. The instructor-facilitated courses, designed to last 6-8 weeks, focus on developing the communication competencies of staff working for United Nations agencies, NGOs, and other institutions working in health and development. Staff members of organizations such as the Academy for Educational Development (AED) and Chemonics (both major USAID contractors), UNDP (United Nations Development Program), the Belgian Cooperation, and the Inter American Development Bank have been successfully trained through this program. Currently, eight courses are offered--*Participatory Communication, Strategic Communication Planning, Field Research in Non-Western Settings, Assessment and Evaluation, Reporting Evaluation and Assessment Results, Media Monitoring, and Microfinancing and Development*. The program's success in online professional training led to its selection by AED as the university partner in a consortium that was awarded the three-year global contract for health and development communication by USAID in October 2008. In June 2009, Communication and Development submitted a bid to UNICEF for a three-year contract to design and develop online courses and face-to-face workshops in communications research, planning, implementation and monitoring and evaluation for UNICEF staff worldwide.

7. UNDERGRADUATE PROGRAMS ASSOCIATED WITH THE CENTER

The Scripps College is a leader in communication education. We prepare students to be effective and responsible communicators in a global society and advance the field through creative activity and research on communication concepts, issues and problems.

Since its founding 40 years ago, the Scripps College has grown from just two schools – communication and journalism – to five schools offering more than 40 nationally acclaimed programs. These range from the technologically-intensive focus of the School of Information and Telecommunication Systems to the theoretical aspects emphasized in the School of Communication Studies – and everything in between in the School of Journalism, and the Schools of Media Arts and Studies and Visual Communication. The breadth of the college makes it a unique experience for students.

The Scripps College blends the programs in each of its five schools to create interdisciplinary experiences. Individually, each school is strong, but by providing collaborative opportunities, student experiences are significantly enhanced. For example, *Trailerpark*, the recent student-driven feature length film in the School of Media Arts and Studies encouraged participation from Visual Communication and Journalism students as set photographers and promotion experts.

Courses designed to attract students throughout the college are evident in all of our schools. This academic year, there were courses in Journalism regarding the presidential election which included students from Communication Studies, Political Science, Broadcasting and Public Relations. Courses in Visual Communication and Journalism are frequently shared, and a significant number of students are working towards double majors in those two areas of study.

In addition to the interdisciplinary experiences within the college, schools encourage, or in some cases require, minors in other disciplines. The Audio Production Sequence in the School of Media Arts and Studies requires a music minor, and although not a requirement, both Journalism and Visual Communication have a number of students who minor in business. And the schools also serve as educational grounds for students across the university. Public Speaking in the School of Communication Studies is, for example, required of almost all students at Ohio University, and Communication Studies is the most popular minor for students in the College of Business.

Collaborative efforts are strong among the schools and WOUB as well. Journalism, Media Arts and Studies and the WOUB Center for Public Broadcasting worked to produce *Gridiron Glory*, a three-time Emmy winning production. This year, students in the school of Media Arts and Studies produced a four-part television series on

the economic plight of Ohio along with the School of Journalism and WOUB. WOUB and Journalism share a state-of-the-art newsroom facility, students, staff, etc. and produce regular news shows such as *Athens Middy* and *Newswatch*.

Certificate Programs

The Scripps College offers certificate programs in Political Communication and Global Leadership. Both programs are further examples of college-led interdisciplinary opportunities. The certificate program in Political Communication partners with the College of Arts and Sciences, specifically the Department of Political Science. Students take classes from both areas and explore the interactions of political figures, political interests, the press and the public in their efforts to influence political outcomes.

The Global Leadership Center (GLC), founded in 1998, offers a two-year undergraduate certificate that prepares students to become internationally-minded, skilled, professional leaders in all walks of life (commercial, governmental and nongovernmental, educational, etc.). The program, which began as a joint venture between the Scripps College of Communication and the College of Business, accepts students from all majors on a competitive basis, admitting 30-35 each year. Students work in teams comprised of both Ohio University and foreign-based students on real-world projects with real-world clients (both in the U.S. and abroad). The project-based action learning approach challenges students to acquire the knowledge and skills they need to work in a rapidly changing world. For the past four years, in a long-term project for the U.S. Commercial Service and the Embassy of Poland, GLC student teams have worked with Ohio-based companies that want to export to Poland or start joint ventures to collect market, industry and country data. These projects have highlighted Ohio's strength in sectors including medical and optical equipment, aerospace, renewable energy and CO2 remediation, e-Health and nanotechnology. GLC students have also worked on annual projects for Procter & Gamble, exploring product ideas for export markets.

8. OUTSIDE COLLABORATING ENTITIES

Ohio Board of Regents

In the twelve weeks between June 8th and August 28th, the Scripps College GRID Lab intends to create an on-line, interactive planning tool for high school seniors illustrating various paths for completing a college degree in Ohio. This will be a functioning prototype utilizing canned data sets from Ohio University, allowing a theoretical High School Senior to successfully strategize his/her way to a college degree. In addition, the tool could also be utilized by a college student to plan the remainder of his/her degree requirements.

American Cancer Society

Since 2002, the college has worked with the Ohio office of the American Cancer Society to promote public awareness of cancer risks in southeastern Ohio, and to provide seed funding for social and behavioral research studies by faculty and graduate students on cancer detection and prevention, and health disparities in rural areas.

NASA

Information and Telecommunication Systems is the only non-NASA site in the world hosting two NASA ACTS Satellite Earth Stations.

9. SUPPORTING SCIENTIFIC, SCHOLARLY AND/OR CREATIVE ACTIVITIES

Faculty received 15 national and numerous state and regional awards within the last two years.

Eighty graduate faculty worked on 297 books, refereed journal articles, conference papers and/or were invited to present scholarly work off-campus in the past calendar year.

Graduate students have won numerous scholarly and creative national awards including Outstanding College Photographer, Promising Professors Award, Fulbright Awards, etc.

Scripps College of Communication faculty held 10 editorships in the past 2 years.

Faculty in the college have applied for \$12,700,817 in grants and other sponsored programs since 2007, and \$7,799,928 in funding has been received from those efforts, a return rate of 61.4%.

Scripps College faculty collaborate with faculty from other colleges, especially HHS, A&S, Education and Osteopathic Medicine as co-investigators on major grant proposals, e.g. NSF, NIH, RWJF.

Significant collaboration with Center for International Studies and Department of Education Title VI National Resource Centers in African and Southeast Asian Studies, and on program grants (USAID, HED, State Department Bureau of Educational and Cultural Affairs).

10. MANAGEMENT PLAN

As an already organized planning unit at Ohio University, the Scripps College of Communication requires no particular management plan as a center of excellence. Management will continue to reside in the college through its leadership structure (dean, associate dean, school directors, et al.). The Deans College Advisory Council, which has membership from communication industries and other stakeholder groups, will act as an external advisory council for the center of excellence.

11. RESOURCE MANAGEMENT AND FUNDING PLAN

Resources for the Scripps College as a center of excellence will be managed through the college as a planning unit with the dean ultimately responsible for their allocation. Ohio University will continue to commit substantial funds to maintaining world-class excellence in the Scripps College. Those commitments will come through the allocation of funds for building projects and by making needs of the college central to the goals of the upcoming university capital campaign. The Scripps College as a designated center of excellence will also be recognized in ongoing reallocation of existing resources through strategic planning at Ohio University.

12. SPONSORED PROGRAM ACTIVITY ASSOCIATED WITH THE PROGRAM

Activity over the past two fiscal years is outlined below. The proposed center of excellence is anticipating a significant increase in sponsored program activity chiefly tied to the Game Research and Immersive Design (GRID) lab.

	FY 08	FY 09 YTD	% Change
Research	\$ 172,046.00	\$ 168,556.00	-2%
Non-Research	\$ 2,689,639.00	\$ 3,261,834.00	21%
<i>Subtotal</i>	<i>\$ 2,861,685.00</i>	<i>\$ 3,430,390.00</i>	<i>20%</i>

13. SUGGESTED METRICS THAT DEFINE EXCELLENCE FOR THE CENTER

1. World Class Academic Talent (Inputs)
 - Faculty awards
 - Institutional investment into physical infrastructure
 - Private investment into program
 - External national and international program rankings

2. Connection to the industry's local economy (value added)
 - Consulting agreements
 - Number of companies that have relationships with the center of excellence
 - Jobs created in the state or region in industries related to the center of excellence
 - Average salary of jobs created in the region or state in industries related to the center of excellence

3. Economic impact (outputs)
 - Jobs in region for the cluster
 - Average salary for jobs in this cluster
 - Graduates places in their field in the state
 - Average salary of graduates



Center of Excellence Proposal for Energy and the Environment Ohio University

1. CENTER OF EXCELLENCE CONCEPT

The production of power and fuels has long been a major part of Ohio's economic vitality. Inexpensive electricity fueled significant industrial development. The mining of coal and extraction of petroleum and gas produces billions of dollars of revenue annually for Ohio. Yet this vital part of Ohio's economy has come at a steep environmental price, ranging from acid mine drainage that severely damages our watersheds to decreased air quality for the state.

As we move forward in the 21st century, accessible, environmentally-friendly, and economical energy is critical to the well being of Ohio and the security of our nation. The United States currently imports 60 percent of our transportation fuels, and 20 percent of our natural gas. Safe and reliable sources of domestic fuel are critical to stabilizing the cost of energy and reducing our reliance on unstable foreign energy sources. Further, the fuel must be produced and used in ways to minimize environmental impacts, ranging from generation of greenhouse gases, mercury or other air pollutants, or the effects of extraction, transport and storage.

Ohio University has established significant research, demonstration, and development strengths in the area of Energy and the Environment, focusing around the production and delivery of energy and fuels, as well as monitoring and control of the pollution that results from that production. Ohio University stands as the first university in the state to recognize the need to integrate the multidisciplinary work of energy and its related environmental impacts through the establishment of the Consortium for Energy, Economics and the Environment (CE3) as part of Ohio University's University Research Priorities process in 2005. Finally, Ohio University is unique in terms of research activity and infrastructure, as well as in geographical location in the heart of Ohio's coal and oil fields, and the nation's electric power "breadbasket," the Ohio River Valley, home to almost 40% of the nation's coal-generated electricity.

The proven need for cutting-edge energy research combined with the established programs in energy and environmental remediation, led the leadership of Ohio University, in consultation with the Board of Trustees, to propose establishing a *Center of Excellence in Energy and the Environment*. The Center of Excellence (CoE) will focus on the production of fuels from regional and alternative fuels, the minimization of pollution due to the production, transport and use of the fuels, and the remediation of existing and future pollution from the energy and fuel production and use. The CoE will further enhance the Ohio University's demonstrated capacity for interdisciplinary research in these areas, promote economic development through generation of new intellectual property, and add value to regional businesses that seek to reduce energy consumption or aim to develop innovative energy or environmental technologies..

In 2006, the Ohio Board of Regents and the Ohio Department of Development commissioned the Battelle Memorial Institute to assess the State's research core competencies. (See report "Positioning the State Of Ohio For Economic Growth: Strategically Aligning Ohio's Research and Technology Portfolio.") The report was based on an extensive analysis of academic and industrial strengths in Ohio and identified thirteen institution-based research core competencies. Of these, Ohio University was identified as having significant research strength in Energy, Power & Propulsion and Environmental Science & Environmental Health with specific and related strengths in:

- Power Engineering – including coal-based gasification, fuels production, power, and solid oxide fuel cells;
- Chemical Sciences – including electrochemistry; nanocomposites; catalysis; environmental chemistry; corrosion chemistry; analytical chemistry, and material science: and

- Earth & Environmental Sciences – including atmospheric sciences; earth sciences; environmental chemistry; environmental biology; biological, chemical and petroleum waste treatment; and environmental health

Ohio University has a long history of working with federal and state agencies as well as the power and energy industry in education, research and service in the production of energy and remediation of environmental effects. The energy industry is critical to Appalachia Ohio, being one of the main providers of jobs that are among the highest paid in the region. On the flip side, this industry has also left a footprint of environmental degradation in the area of Ohio with the highest poverty and unemployment rates, further contributing to economic disparities. Ohio University plays a pivotal role in enhancing both the environmental and economic conditions of Appalachia Ohio by identifying, recognizing, and addressing the energy and environmental needs of critical concern to our region and to the State of Ohio.

Towards those ends, the proposed Center of Excellence will focus on:

Internally

- Developing technologies for the low cost and sustainable creation, transport and use of fuels and power from domestic sources;
- Monitoring, assessing and remediating pollution related to the production of fuels and power;
- Creating synergistic, interdisciplinary teaching and research opportunities to produce high impact, extramurally-funded federal, state, and private research;
- Educating highly-qualified researchers, professionals, and policy makers; and
- Expanding entrepreneurship and provide economic analyses in the areas of fuels production and environmental remediation.

Externally

- Retaining energy generation jobs, the total in Ohio which is estimated to be 42,000.
- Ohio University technologies will create new jobs in green employment. According to the Pew sponsored report “The Clean Energy Economy”, Ohio ranks among the top five in such jobs. We expect technologies of Ohio University’s and similar technologies to generate over 1000 new jobs in Appalachian Ohio alone.
- Reducing Ohio’s carbon footprint is expected to be a significant cost reduction to Ohio businesses and consumers particularly if cap and trade legislation becomes the regulatory norm for reducing carbon dioxide and other greenhouse gas emissions . Businesses that are more profitable create more jobs due to enhanced revenue availability.
- With or without cap and trade legislation, new jobs in environmental services will be required to support the regulation and reduction of carbon emissions. Ohio University expects to be a leader in education in the area of carbon management. The carbon management industry could grow to \$1B in Appalachia by 2020.
- Recovering 120 miles of streams and rivers in Ohio to attain their Clean Water Act standards. This will create 75 jobs.

2. SCOPE OF ACTIVITIES

Institutional Commitment

Ohio University has significantly invested in the development of the programs upon which this Center of Excellence is based. This has allowed the University to transition developing projects into more integrated programs with activities yielding significant economic and community impact. The institution’s commitment consists of the recruitment and retention of faculty including a \$5 million investment in the Ohio Research Scholar in Coal Syngas Utilization, multi-million dollar investments in additional space and facilities, establishment of the Consortium for Energy, Economics and the Environment to coordinate and facilitate energy

and environmental research, and alignment of the foci of the CoE with Vision Ohio, the strategic planning process and academic plan for Ohio University.

In addition, the University has invested significant resources in two of the research institutes involved in the production and distribution of fuels. In 2007, Ohio University allocated 9,500 square feet of new research space for the Institute for Sustainable Energy and the Environment (ISEE), which oversees the Ohio Coal Research Center (OCRC), the Electrochemical Engineering Research Laboratory (EERL), the Center for Air Quality (CAQ) and the Biofuels Laboratory. In addition, the University has invested nearly \$5 million in the Institute for Corrosion and Multiphase Technology (ICMT), which is one of the largest oil/natural gas/CO₂ pipeline research institutes in the world. The Russ College of Engineering and Technology has developed long-term plans to endow chairs in Pipeline Corrosion, as well as use resources from the Russ Family gift (\$95 million) to enhance energy and environmental research within the College. In addition, Ohio University has pledged three named chair positions in Energy and the Environment for the CoE that will be included in the Ohio University Foundation's upcoming capital campaign.

Sustainability

In the proposed Center of Excellence, sustainability will be maintained by building on a strong foundation (described below) and by a commitment on the part of colleges, the Office for Research and Creative Activity, the Voinovich School, and the institution to support continued growth in this area through faculty and staff hiring, pursuit of external funding and business partnerships, development of research facilities, and strengthening of graduate programs connected to energy and the environment.

Ohio University has demonstrated over the last decade sustainability by securing sponsorship and establishing an integrated infrastructure, educational programs, and faculty expertise. Some examples are:

- Centers and Institutes –Institute for Sustainable Energy and the Environment (The Center for Air Quality, Ohio Coal Research Center, Electrochemical Engineering Research Lab, Biofuels Research Group); Institute for Corrosion & Multiphase Technology; Ohio Center for Ecology and Evolutionary Studies;
- Multidisciplinary Schools and Graduate Programs -the multidisciplinary Voinovich School, which focuses on energy and environment, entrepreneurship and applied policy research, and houses the only Master of Science in Environmental Studies program at a public institution of higher education in Ohio;
- Buildings – Stocker Center, Academic Research Center; West State Street ISEE facilities; Corrosion Center, Voinovich School;
- Shared facilities – Scanning Electron Microscopy, Machine Shop (ISEE), Electro-chemical Engineering Research Laboratory (Molecular Modeling, Electrode Manufacturing Facility, Advanced Electrochemistry testing systems); Ohio Coal Research Center (solid oxide fuel cell testing facility able to handle coal syngas), Corrosion Test Equipment for high-pressure CO₂ and H₂S, Analysis Equipment for Criteria Air Pollutants, Air Quality Modeling, Geographic Information Systems Analysis; and
- University programs— As the only Third Frontier ESP in the state awarded to a public university, TechGROWTH Ohio works to accelerate commercialization strategies, open new markets for companies in southeast Ohio, and assist early-stage businesses obtain sufficient equity capital for sustainable growth. TechGROWTH Ohio has embedded Executives in Residence at the Edison Biotechnology Center, the Innovation Center and several private energy and environmental firms throughout the region. This unique model has integrated technology commercialization, company development, investment capital, and business growth in these critical areas. In effect, the university has created an integrated service infrastructure for energy and environmental businesses which is borne out by the program's metrics which indicate that at least 21 companies have received technical and operational assistance since the program's inception in 2007.

Sustainability is further promoted through existing individual investigators' externally funded research programs and the potential for additional funding of collaborative initiatives. Multidisciplinary collaboration is well-established, with cross-department, cross-college, and multi-university and joint partner research efforts, proposals, papers, and graduate committees.

The State of Ohio and the federal government are expected to continue to invest in energy and environmental issues. Indeed, it is one of nine targeted industries for economic development, as stated in the Ohio Department of Development Strategic Plan.

Exemplar Activities

The quality of the faculty in the proposed Center of Excellence is shown in the strength of their research funding, scholarship and breadth of efforts. Currently more than 40 faculty and staff members – from the College of Arts & Sciences, College of Health & Human Services, Russ College of Engineering and Technology, and Voinovich School for Leadership and Public Affairs have had externally funded research that falls within the scope of the proposed CoE. While much of the significant funding has been generated by a core group of nine faculty members, all the associated faculty participate in the research and scholarly activities described in the information below.

One indicator of the strength of Ohio University's research in energy and the environment is found in the total amount of related funding from FY 2003-2008. The average funding per core faculty member is more than \$400,000. The total external funding for this research during this period was \$28.1 million with the following breakdown:

- Energy and fuels research (clean coal, fuel transport & processing, pipeline corrosion, fuel cells, hydrogen generation, biofuels, carbon recycling): \$17.6M
- Air Quality (criteria pollutant monitoring, modeling, control, health effects): \$4.2 M
- Environmental Science (remediation, monitoring, ecology of acid mine drainage): \$6.3M

While there are more than 100 projects and efforts that could be cited as showing the interdisciplinary and cross-cutting research and development efforts of the investigators in the proposed Center of Excellence, we point to these examples of excellence. Additional information can be found in Appendix II.A (Review of the Institute for Sustainable Energy and the Environment) and Appendix II.B (Annual Report for the Consortium for Energy, Economics and the Environment).

Coal-based Energy and Fuels Research

The Ohio Coal Research Center has been researching cleaner uses of coal as a source of energy since 1965. Work in production and utilization of synthesis gas developed from coal led by Dr. David Bayless, Loehr Professor of Mechanical Engineering and Fellow of the American Society of Mechanical Engineers, has drawn more than \$5.5 million in external funding. Using novel high temperature fluidized bed gasification, syngas can be economically produced from coal or biomass at scales much smaller than the highly capital-intensive utility installations. The syngas produced from gasification can then be used directly as a fuel for the production of electricity, or as a feedstock for synthesis of transportation fuels. This work was the basis for the award of the Ohio Research Scholar position in Coal Syngas Utilization.

Because syngas produced from coal contains contaminants, such as sulfur, mercury and arsenic, its use as a fuel is often restricted to more robust, but less efficient energy conversion methods. Use of solid oxide fuel cells for conversion of syngas fuel to electrical power and heat offers far greater efficiency than through combustion, but is also sensitive to the contaminants in the syngas. The Ohio Coal Research Center is one of the nation's leading labs in identifying and testing the effects of coal contaminants on fuel cell operation. Further, with its partners Case Western Reserve University, Rolls Royce Fuels Cell Systems (N.A.), and the Department of Energy, the Coal Center has developed several contaminant-tolerant anodes with several patents pending.

Finally, it should be noted that the outstanding work of the Coal Center has been recognized by the Ohio Coal Development Office. In fact, Ohio University has managed OCDO's University Research Consortium since 2000 and all but four years since its inception in 1990.

Electrochemical Production of Fuel

Led by Dr. Gerri Botte and nearly \$4 million in external support, the Electrochemical Engineering Research Laboratory (EERL) has developed and patented unique electrolysis technology to convert ammonia waste streams (such as from agricultural waste) into hydrogen and transportation fuels. This technology has led to the award of a Third Frontier grant, as well as a \$2.6 million dollar grant from the Department of Defense to use this technology to provide greater fuel flexibility for combat operations.

Oil, Natural Gas and CO₂ Pipeline Integrity

Our nation runs on hydrocarbons. The delivery of this fuel in a safe and environmentally-responsible manner requires understanding and implementing technologies to minimize corrosion of hundreds of thousands of miles of pipelines. The Institute for Corrosion and Multiphase Technologies (ICMT), led by Dr. Srdjan Netic, Fellow of the National Association of Corrosion Engineering, is one of the world's largest institutes dedicated to understanding the effect of oil, gas, water and CO₂ corrosion on pipeline systems, with laboratory equipment and space valued at more than \$15 million. With more than \$3 million in annual funding from industry alone, ICMT is the leading institute for pipeline corrosion. Institute researchers have developed MULTICORP software, which is internationally used, for the prediction of pipeline corrosion. And their work is critical to our fuel supply. As oil fields are depleted, more CO₂ and water are pumped into the reservoirs for enhanced oil recovery, meaning increased corrosion challenges in the delivery of the oil-water mix to refineries.

Further, one solution being seriously considered to limit greenhouse gas emission is the sequestration of supercritical CO₂. This will require new pipeline to safely deliver CO₂ to the sequestration sites. ICMT is leading efforts for government and industry in providing understanding of the effects of supercritical CO₂ corrosion that will be applied to ensure pipeline integrity, both now and in the future. ICMT also is researching corrosion of wellbore materials.

Microalgal Carbon Recycling and Fuel Production

The Ohio Coal Research Center and Biofuels Lab have engaged in more than a decade of research into the reuse of carbon dioxide using microalgae. With more than \$2 million in funding from the Department of Energy, the only federally funded algae-based CO₂ remediation from coal effort in Ohio, researchers have created bioreactor technologies to enhance the growth of microalgae from coal flue gas. And just as importantly, the researchers are developing technologies to convert the energy within the algae into biofuels, such as biodiesel and syngas.

Air Quality in the Ohio Valley

Led by Dr. Kevin Crist, the Air Quality Center has the only university-based air quality monitoring "supersite" for monitoring SO₂, particulates, mercury, ozone, CO₂, CO, and NO_x in Ohio. With more than \$5 million in external research grants, the Air Quality Center supports every metropolitan area in the state with modeling, monitoring and policy input data. The Center's researchers, two full-time research staff and graduate students are currently engaged in studying the fate of mercury emissions from local power plants, as well as world-wide sources, to understand the economic and environmental value of implementing control systems on local power plants. Further, the Air Quality Center is working with Columbus, Cleveland, Cincinnati and the Ohio Manufacturing Association (including its members) to identify cost effective control strategies to meet the federal air quality standards.

Watershed Remediation and Water Quality

The Appalachian Watershed Research Group is a model of interdisciplinary research and education. With more than \$6 million in funding, investigators from two colleges and the Voinovich School of Leadership and Public Affairs are addressing critical watershed issues in the Ohio River Valley. Over the last ten years, they have collected data on water chemistry and biological assemblages from across the region, trained hundreds of students

and volunteers in stream and river monitoring, have worked with numerous state and federal agencies to remediate the effects of acid mine drainage, the region's largest sources of water pollution, and developed tools for identification of environmental stressors in watersheds of this region. A data management evaluation and visualization tool has been developed that has been heralded by the US EPA as a national model for displaying complex data sets for river restoration.

Entrepreneurial Signature Program for Business Development in Appalachia

TechGROWTH Ohio, the only Entrepreneurial Signature Program (ESP) in the state located at a public University, is designed to help early-stage innovative businesses obtain professional assistance and sufficient equity capital for sustainable growth with the goal of opening new markets for companies in southern and eastern Ohio. One of the four "signature areas" *TechGROWTH Ohio* has focused on since its inception has been advanced energy. To date, over 60% of *TechGROWTH Ohio*'s metrics have been achieved on behalf of Advanced Energy companies. These include: Global Cooling (<http://www.globalcooling.com/>), which leveraged the expertise of a *TechGROWTH Ohio* entrepreneur in residence and was able to obtain a \$1M Third Frontier Advanced Energy Grant to further develop its product offerings. *TechGROWTH Ohio* helped this company build on the state investment and secure a \$3.9M investment commitment from a European company to expand manufacturing operations and create jobs.

Economic and Cost Analysis

Finally, it should be noted that the research and development programs in energy and the environment are strongly aligned to economics, both in terms of analysis and in practicality. Ohio University has provided detailed economic modeling of potential pollution control policies, technologies and implementation schemes to both government and industry. In addition, Ohio University has developed expertise through research in cost estimation. Ohio University is the only U.S. University with a focus effort of cost estimation of power and propulsion systems. The Ohio University team has developed models to estimate the forming, process, and machining costs of traditional metal alloy, super alloy, and composite parts and created unique cost tools that incorporates process knowledge. This was developed under a \$21M ATP program funded by NIST.

Comparison to Other Programs

There are a number of energy-related research groups in the nation and world, and numerous other environmental research centers and institutes. However, Ohio University stands as a unique example of interdisciplinary work bringing together researchers in energy and fuels production, fuels transport, environmental monitoring, assessment and remediation, data analysis, and economic/cost analysis, all aligned with regional economic development goals.

Nationally, there are a number of excellent energy and environment institutes at prestigious universities, nonprofit research institutes, and nationally funded laboratories. Among the university organizations are the Center for Environmental Prediction at Rutgers University; the Desert Research Institute affiliated with the University of Nevada; Stanford University's Global Climate and Energy Project; and the Energy, Environment and Resources Center at the University of Tennessee at Knoxville. Prestigious nonprofit organizations working on energy issues include the Northeast States for Coordinated Air Use Management, the Mid-Atlantic Regional Air Management Association, and the Rocky Mountain Institute. Governmental agencies and national laboratories involved in such research include the Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi; the Department of Energy's National Energy Technology Laboratory; the Oak Ridge National Laboratory's Center for Energy and Environmental Analysis; and the Energy and Environment Division of the Lawrence Berkeley National Laboratory in California as well as the US EPA's Office of Wetlands, Oceans, and Watersheds. However, none of the aforementioned research entities conducts research focused in Appalachia Ohio and the Ohio River Valley Region, purported to be the greatest source of pollution in the nation.³¹ The impact of the Ohio

³¹ 2002 National-Scale Air Toxics Assessment (released June 2009) <http://www.epa.gov/ttn/atw/nata2002/>; American Lung Association, "State of the Air, 2009" <http://www.stateoftheair.org/2009/key-findings/executive-summary.html>.

River Valley on national health and well-being justifies the existence of a Center of Excellence to focus on this region and fill this niche.

Among schools near the consortium's target region, Penn State University's Institutes of Energy and the Environment are perhaps the closest model to the proposed CoE. With twenty-five dedicated faculty lines, the institutes conduct research on energy efficiency, alternate sources of energy, energy economics, and energy legislation. Major themes that resemble those of the proposed Center at Ohio University are air quality, global change, and water resources. The institutes provide matching funds, an environmental forum, monitoring of external funds, and a Web page (<http://www.environment.psu.edu/default.asp>). The CoE will differ from the Penn State institutes in its focus on fuels from regional and alternative fuels, the minimization of pollution due to the production, transport and use of the fuels, and the remediation of existing and future pollution from the energy and fuel production and use.

Through leadership in the University Clean Energy Alliance of Ohio and the Ohio Coal Research Consortium (funded by the Ohio Coal Development Office), Ohio University has been able to develop complementary research expertise with respect to the other universities in Ohio. For example, The Ohio State University has distinguished itself with leadership in geological sequestration for greenhouse gas control, while Ohio University has focused on carbon recycling and reuse through the production of biofuels using microalgae.

Ohio University has the only university-based integrated air quality monitoring, modeling and assessment operation in Ohio and the only electrochemical engineering research center focused on the production of transportation fuels from waste streams. Further, Ohio University stands as the main partner for the Ohio Department of Natural Resources in acid mine drainage reclamation efforts.

3. PROSPECTS FOR DRIVING ECONOMIC ADVANCEMENT

*“As part of a broader national crisis in science and math education, institutions of higher education and the public and private sectors are struggling to train and retain talented specialists in energy research and skilled technicians in energy-related specialties. This need will only grow as more energy professionals and technicians are required – new professions will emerge as a result of investment in sustainable energy.”*³²

*“Human capital development in the sustainable energy sector that is vital to the discovery of sustainable energy solutions, as well as to the achievement and maintenance of a sustainable energy economy. Increased efforts are needed in education and workforce development related to sustainable energy research, technology development, and deployment. These efforts include ensuring the U.S. education system addresses the technologies of today and the skills required in the future.”*³³

As the country's sixth largest energy consuming state, and the fourth highest emitter of greenhouse gases, Ohio has a major stake in developing and building clean, affordable and reliable energy systems to sustain its economic growth. A recent report by The Pew Charitable Trusts lists Ohio as one of only 12 states nationally that have “large and growing clean energy economies³⁴.” This same report lists Ohio 4th in jobs created in clean energy, 3rd in energy efficiency, 4th in environmentally friendly production and 7th in jobs related to conservation and pollution mitigation.

Ohio's green economy is also strengthened by the state's energy and environmental economic development initiatives in the areas of alternative fuels and power production. Ohio has the fifth highest concentration of Fortune 500 companies (2008), is second in the nation in the potential for component manufacturing in the wind

³² National Science Board. “Building a Sustainable Energy Future.” April 10, 2009. Draft for Public Comment. www.nsf.gov/nsb/publications/2009/comments_se_report.pdf

³³ Ibid, 8.

³⁴ The Pew Charitable Trusts “The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America” June, 2009

supply chain,³⁵ is a major distribution and logistics hub, and has led the nation over the past three years with 350 facilities completed in the alternative energy sector.³⁶ While energy and environmental jobs constituted less than 1% of total industry employment in 2007, the annual income of these jobs averaged more than \$66,000 compared to an overall state median salary of \$27,000 and a median manufacturing salary of \$35,000.³⁷

Energy and the environment are poised to be major growth sectors for economic development and employment. National capital investment in the green tech/clean tech sector is at an all-time high and even though current economic conditions are slowing overall investment, venture capital continues to provide support with more than \$2.2 billion, or approximately 7.4% of all U.S. venture capital investments going to this sector in 2007. This represents almost triple the investment in this sector in 2005. These investments will generate high-paying jobs which will require specialized education and training.

The National Academies has also put forth recommendations on how to create high-quality jobs for Americans, and respond to the nation's need for clean, affordable and reliable energy through K–12 education, research, higher education and economic policy. The proposed Center of Excellence will address these issues as well as it promotes green research, education and jobs.³⁸ To meet the demands of this growing industry, and to build upon Ohio's strengths listed above, Ohio University is increasingly engaging its partners and students on basic and applied research and outreach projects related to energy and the environment. A Center of Excellence in Energy and the Environment at Ohio University provides excellent prospects for driving economic advancement in the region and the State of Ohio. Economic benefits will be advanced in several ways:

- Job creation through company start-up and attraction
- Job creation through economic assistance
- Job protection through technology and knowledge
- Workforce development
- University creative activity

Job creation through company start-up and attraction

“Experimentation with new models for accelerating university-based research should be of increasing importance. Although universities in the past have accounted for a relatively small portion of new high-tech ventures, the growing sophistication and complexity of technology should give university faculty a bigger seat at the entrepreneurial table in coming years, especially with the right mix of policies.”³⁹

These opportunities are established in part from existing businesses around the state and with support from Ohio's research labs and institutions, such as Ohio University. Specifically, the advanced energy technologies created by fuel cells, bioreactors, and the ammonia catalytic electrolyzer at Ohio University could spark the creation of new companies in Ohio and the attraction of existing companies to Ohio with the support of state and local incentives. These new companies are formed to commercialize the intellectual property developed by the university or to take advantage of the faculty expertise at the university. These companies will create new job opportunities. The rapidly growing environmental technology industry contributed \$3 billion to the state's economy in 2003, generating an additional 70 cents in purchases within the state for every dollar of final demand.⁴⁰

³⁵ Ohio Business Development Council. “Capture the Wind in Ohio” brochure.

³⁶ Starner, R. Site Selection Magazine. July 2008.

³⁷ U.S. Bureau of Labor Statistics.

³⁸ National Academy of Sciences, “Rising Above the Gathering Storm.” 2007. www.nap.edu/catalog.php?record_id=11463.

³⁹ Ewing Marion Kauffman Foundation. “On the Road to an Entrepreneurial Economy: A Research and Policy Guide. Version 2.0,” July, 2007.

⁴⁰ Deloitte. “Industry-Based Competitive Strategies for Ohio: Managing Three Portfolios.” 2005.

www.development.ohio.gov/strategicplan/documents/Industry-BasedCompetitiveStrategies-Deloitte&CSU.pdf

The proposed Center of Excellence has a tremendous track record of generating new intellectual property that can be commercialized. Several indicators of economic advancement related to the proposed Center of Excellence include:

- An intellectual Property Portfolio containing 46 invention disclosures, 36 patent applications, 9 patents;
- Numerous OU Intellectual Property licenses or near term:
 - Wet membrane electrostatic precipitation (Southern Environmental Inc.)
 - Membrane microalgal bioreactor (Greenshift)
 - Air lift microalgal bioreactor (Green Bios)
 - Novel precipitator electrodes (Southern Environmental)
 - Sieving electrostatic precipitator
 - Sulfur tolerant solid oxide fuel cells
 - High temperature gasification with carbon recycling

Ohio University's Innovation Center provides significant assistance in developing commercial ventures from intellectual property. With the help of the Innovation Center, several faculty members have or are planning to incubate companies around their IP in this field, including electrochemical production of fuels and biofuels.

Job Creation through economic assistance

Not all companies related to energy and the environment are generated from university IP. Even so, the proposed Center of Excellence is available to help those companies as well through the Voinovich School of Leadership and Public Affairs, the Ohio University Entrepreneurial Signature Program *TechGROWTH Ohio*, and the Ohio University Innovation Center. As these companies become stronger, they provide more job opportunities and support economic development in the state.

The Center of Excellence has strong ties to the Entrepreneurial Signature Program *TechGROWTH Ohio* and to the Ohio University's Innovation Center. Both entities provide significant opportunities for taking technology from the Center of Excellence into the marketplace. *TechGROWTH Ohio's* focus on advanced energy and sustainable environment has led to more than 60 percent of its metrics being achieved in the Energy Alternatives signature area.

In partnership with the Ohio University College of Business, the Voinovich School's professional business consultants and project managers work side-by-side with business and engineering students and faculty. Since 2005, the Voinovich School has provided assistance to over 1,700 businesses and entrepreneurs and assisted businesses in securing \$62 million in loans from local and regional banks, \$80 million in government contracts, \$3.5 million in funds from individual investors, and \$8 million in venture capital funding. The university's strengths and ties to the region are numerous for the promotion and creation of green businesses and jobs.

Job protection through technology and knowledge

The economy in Southeast Ohio is closely associated with the use of coal for power generation. Many jobs are available for coal mining, coal transportation, and coal-fired power plants. The jobs are at risk due to the environmental impact caused from burning coal. By advancing technology to minimize or eliminate the environmental effects, many jobs in the coal mining and power generation industry will be saved. The electrostatic precipitator is an excellent example of technology that can reduce the emissions generated at a coal-fired power plant.

Ohio's industrial heritage of resource extraction and manufacturing has been rapidly changing in the face of global economic pressures. The Ohio Department of Job and Family Services reported a loss of over 200,000 manufacturing jobs between 2000 and 2007. And despite the fact that Ohio, particularly Southeastern Ohio, has a cultural history in mining, in 2007, Ohio ranked fifth out of eight states in the Appalachian Region for coal

production,⁴¹ creating fewer than 2,500 jobs in underground and surface coal mining combined.⁴² Changing requirements for electrical generation in Ohio and throughout the nation are going to diversify Ohio's electrical generation mix which is presently heavily reliant upon coal (89%) and nuclear (10%). Cutting-edge technology, coupled with huge capital investment and workforce training, has the capability to transform the economy of southern and eastern Ohio by diversifying our power mixture and transitioning the region to a cleaner energy future. This shift away from traditional industries into advanced energy coupled with pollution control and remediation offers Ohio a brighter outlook for the future.

Equally important is the environmental knowledge and resources that the proposed Center of Excellence can provide to the region. Air quality and water quality protection are provided to the citizens of Ohio through the center. Ensuring safe air and safe water protect the existing jobs in the coal region. OHIO's Center of Excellence will build upon the university's core competencies in air quality and water quality monitoring. The Center for Air Quality collaborates with regional governmental planning organizations and private-sector companies to conduct emissions monitoring and modeling. These analyses lead to summer ozone health alerts for every major metropolitan area of the state, emissions compliance for industry and the development of standards for new pollutants such as mercury and CO2. Water quality analyses have led to the restoration of more than 20 miles of contaminated streams and rivers and have increased the regional economy by millions of dollars through civil engineering, heavy equipment construction, and environmental remediation services which have renewed fishing and boating in the region.

A recent Voinovich School analysis of data from IMPLAN, an economic impact assessment system, focused on jobs related to energy and the environment. The analysis shows that the market sectors listed had a combined \$47.78 billion impact on Ohio's economy in 2007 (the most recent year we have data for). These industries provided employment (over 108,000 jobs in 2007) and employee compensation (\$7.15 billion).

The multipliers are generated by the model and could be used to describe how, for each industrial sector, the number of additional money and ancillary jobs that are created as a result of the direct employment of that person in that sector. For instance, for every dollar generated in the electric power generation sector, and for every job created in that sector, there is an additional \$1.34 in output, an additional 2.58 jobs, and an additional \$1.48 in employee compensation added to Ohio's economy.

Table 1. 2007 industrial output, employment and employee compensation for energy and environmental sectors with high-growth potential in Ohio⁴³

Sector	2007 Industry Output*	2007 Employment	2007 Employee Compensation*	2007 Average Annual Salary
Extraction of oil and natural gas	3839.095	10,834	287.871	\$26,571
Mining coal	679.42	2,250	161.516	\$71,785
Drilling oil and gas wells	533.044	952	40.328	\$42,361
Support activities for oil and gas operations	355.893	1,576	77.236	\$49,008
Support activities for other mining	269.869	614	42.955	\$69,959
Electric power generation- transmission- and distribution	10130.599	16,569	1816.541	\$109,635
Natural gas distribution	3290.324	3,517	310.108	\$88,174

⁴¹ Energy Information Administration. "Annual Coal Report 2007 Executive Summary." www.eia.doe.gov/cneaf/coal/page/acr/acr_sum.pdf.

⁴² Energy Information Administration. "Average Number of Employees by State and Mine Type." www.eia.doe.gov/cneaf/coal/page/acr/table18.html.

⁴³ Data were obtained from IMPLAN, an economic impact assessment system, which bases its data on the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (ES-202) and Bureau of Economic Analysis' Regional Economic Information System (REIS).

Sector	2007 Industry Output*	2007 Employment	2007 Employee Compensation*	2007 Average Annual Salary
Water- sewage and other systems	180.39	1,157	70.112	\$60,598
Petroleum refineries	11617.802	1,534	258.421	\$168,462
Petroleum lubricating oil and grease manufacturing	560.812	597	62.683	\$104,997
All other petroleum and coal products manufacturing	111.985	121	12.423	\$102,669
Petrochemical manufacturing	1066.093	487	57.075	\$117,197
Industrial gas manufacturing	925.246	815	83.911	\$102,958
Power boiler and heat exchanger manufacturing	552.196	1,774	164.809	\$92,902
Valve and fittings other than plumbing manufacturing	2351.314	7,732	506.308	\$65,482
Fabricated pipe and pipe fitting manufacturing	344.253	1,477	78.516	\$53,159
Mining and oil and gas field machinery manufacturing	140.334	686	42.803	\$62,395
Turbine and turbine generator set units manufacturing	324.97	619	63.006	\$101,787
Speed changer- industrial high-speed drive- and gear manufacturing	208.7	899	62.004	\$68,970
Mechanical power transmission equipment manufacturing	204.54	883	56.821	\$64,350
Other engine equipment manufacturing	1770.521	2,424	147.271	\$60,755
Automatic environmental control manufacturing	283.901	1,256	67.768	\$53,955
Power- distribution- and specialty transformer manufacturing	250.411	768	67.262	\$87,581
Motor and generator manufacturing	939.439	2,823	199.349	\$70,616
Storage battery manufacturing	230.9	868	56.388	\$64,963
Communication and energy wire and cable manufacturing	141.244	245	14.553	\$59,400
Environmental and other technical consulting	820.12	6,126	287.421	\$46,918
Scientific research and development services	2943.793	22,483	1372.889	\$61,063
Waste management and remediation services	2715.439	14,812	687.783	\$46,434
Sum	47782.647	106,898	7156.131	\$66,944

*Millions of dollars

Workforce development

To capitalize on the interdisciplinary nature of energy and environmental issues, OHIO's Center of Excellence will streamline research and curriculum to foster in-depth and hands-on learning experiences for students and faculty. The Russ College of Engineering and the Voinovich School maintain robust internship and co-op programs that have placed hundreds of students with state businesses, research labs, government agencies and nonprofit organizations. OHIO has sponsored students in countless private-sector placements including AEP,

FirstEnergy, Battelle, Columbia Gas, Duke Energy, Buckeye Power, Rural Action, The Midwest Biodiversity Institute and the Ohio Department of Development.

Coordination at a regional and state level for energy and environmental initiatives is imperative to avoid duplication of efforts and resources. Therefore, the Voinovich School and its partners are working with the Ohio Skills Bank to produce a 21st century workforce in Southeastern Ohio's key economic sectors, including energy and environmental technologies. The School provides assistance to the OSB in Southeastern Ohio by providing analysis to identify the region's key employment sectors and by convening all of the region's higher education institutions to focus on these priority sectors. In turn, the region's educators have worked with employers in each sector to develop higher education programs to fill each sector's most critical and growing occupations.

Economic impact of the university

“Public universities ... typically are very aware of a public service mandate to provide economic development services to their state and region, and will have implemented a variety of programs with a combined emphasis on outreach, research and teaching.” “ Whether creating patentable technologies, providing foreign-language fluent grad students, or helping to take a citizen through the steps of starting a small business, the university is serving as the nexus through which independent economic activity can emerge”⁴⁴

In 2007, Hanover Research Council identified six means by which universities impact their regional economic development. These include:

- Technology transfer and commercialization
- Extension services and satellite campuses
- Small business development centers
- International trade centers
- Institutes for entrepreneurship and innovation
- Research Parks⁴⁵

OHIO's Center for Excellence integrates and focuses all of these activities to provide the foundation upon which innovation in Ohio's energy and environmental sector will grow and flourish.

It is important to highlight Ohio University's impact to the regional economy. As a major employer in southeast Ohio, the revenue generated by external funded research and IP licensing creates jobs at OU and in the region. According to OBOR, each \$1M in external funding generates 32 jobs. With \$28M in external funding, there would be nearly 900 job years created from this revenue source alone.

Finally, according to *Forbes* magazine, Ohio University is ranked 4th in the country for the amount of license revenue generated per unit of research funding. This ranking is a significant achievement for Ohio University and demonstrates the university's emphasis on nurturing intellectual property through multiple successful processes. The Vice President for Research (VPR) at the University manages an annual internal award investment portfolio of more than \$500,000 to support research projects, from initiation to completion. VPR identifies projects with potential for intellectual property and involves the Technology Transfer Office. In 2009, the Office instituted a new program, the Technology Gap Fund, with an annual budget of \$200,000 to provide limited but critical resources to test and refine inventions to add value and de-risk the technologies. As part of the process, applicants are given feedback regarding their proposed business plan from the committee composed of university research, venture capital investors, and entrepreneurs. Licenses from energy-related technologies garnered \$745K in royalty fees from 2005-09.

⁴⁴ The Hanover Research Council, *The Role of Universities in Regional Economic Development*, 2007.

⁴⁵ Ibid

4. FACULTY MEMBERS ASSOCIATED WITH THE CENTER

Faculties associated with the Center of Excellence are presented by research area. Resumes of core faculty and brief biographies of affiliated faculty and staff are included in Appendix II.C.

Energy

- **David Bayless**, *Loehr Professor of Mechanical Engineering*; Biosequestration of Greenhouse Gases. Gasification of coal and biomass. Biorefining and Biodiesel. Adapting Solid Oxide Fuel Cells to Gasified Coal. Wet and dry electrostatic precipitation. Mercury removal using membrane-enhanced ESP.
- **Anima Bose**, *Research Assistant Professor of Chemical and Biomolecular Engineering*; Fuel Cell technology. Hybrid Vehicle technology. **Gerardine Botte**, *Associate Professor of Chemical and Biomolecular Engineering*; Fuel Cell technology. Battery technology. Modeling, Design, Construction and Testing of novel electrochemical technologies. Coal and ammonia as sources for hydrogen to power Fuel Cells.
- **Carl Brune**, *Associate Professor of Physics and Astronomy*; Nuclear Astrophysics, Weakly-bound states of nuclei.
- **David Drabold**, *Distinguished Professor of Physics and Astronomy*; Theoretical Condensed Matter, Computational Methodology for Electronic Structure, and Theory of Topologically Disordered Materials.
- **Sasha Govorov**, *Associate Professor of Physics and Astronomy*; Theoretical Condensed Matter Physics: Physics of semiconductor nanostructures, optical and transport phenomena, many-body effects, quantum phenomena, nanoscience.
- **Ken Hicks**, *Professor of Physics and Astronomy*; Experimental Nuclear and Particle Physics.
- **Saw Hla**, *Associate Professor of Physics & Astronomy*; Experimental Nanophysics.
- **David Ingram**, *Professor of Physics and Astronomy*; Atomic Collisions in Solids, Thin Films, Deposition and Analysis.
- **Greg Kremer**, *Chair of the Mechanical Engineering Department, and Associate Director of the Ohio Coal Research Center*; Energy and the environment, including alternative methods of power production and advancements in automotive technologies, including alternative fuels, on-board electrochemical reformation of ammonia into hydrogen, fuel cell vehicles, and hybrid-electric vehicles.
- **Tadeusz Malinski**, *Chair, Department of Chemistry & Biochemistry and Marvin & Ann Dilley White Professor*; Nanomedicine, nanobiotechnology, nanosensors and nanodevices for medical applications. Durable high-energy Li-ion battery.
- **Srdjan Nesic**, *Professor of Chemical Engineering and Director, Institute for Corrosion and Multiphase Flow Technology*; CO₂ Corrosion, Erosion, Erosion-corrosion, Electrochemistry, Computational and Experimental Fluid Dynamics, Multi-Phase Flow, Thermodynamics, Heat and Mass Transfer.
- **Michael Prudich**, *Professor of Chemical and Biomolecular Engineering*; Alternative Energy
- **Guy Riefler**, *Associate Professor of Civil Engineering*; Biodegradation, Biotechnology and Bioengineering, Environmental Engineering Science, Environmental Science and Technology, Environmental Technology, Pesticide Biochemistry and Physiology, Quantitative Microbiology.
- **Ben Stuart**, *Executive Director, Institute for Sustainable Energy and the Environment and Director, Biofuels Research Laboratory, Department of Civil Engineering*; Biofuels, CO₂ mitigation, Acid Mine Drainage.
- **Carole Womeldorf**, *Assistant Professor of Mechanical Engineering*; Renewable Energy Systems (wind power, wind resource assessment, ocean wave power generation, biomass, distributed power generation). Combustion and Fire Sciences, Engineering Education, Heat Transfer, Fluid Dynamics.

Air Quality

- **Khairul Alam**, *Moss Professor of Mechanical Engineering*; Electrostatic Precipitation, Thermal transport.
- **Kevin Crist**, *Professor of Chemical and Biomolecular Engineering*; Urban- and regional-scale air-quality monitoring, emission inventory assessments, and photochemical, dispersion, and radiative transfer modeling.
- **Rudy Pasic**, *Professor of Mechanical Engineering*; Fatigue Damage of Engineering Materials, Advanced Methods for Solving Differential Equations.
- **Tim Ryan**, *Associate Professor of Environmental Health and Industrial Hygiene*; Indoor Air Quality, Video Exposure Assessments, Volatile Organic Pollutants, Distance Education.
- **Valerie Young**, *Chair, Department of Chemical and Biomolecular Engineering*; Air quality monitoring and modeling, Measurements of organic compounds at ppt-levels in the atmosphere, Modeling transport and fate of atmospheric pollutants.

Biological Monitoring, Remediation and Acid Mine Drainage

- **Jared DeForest**, *Assistant Professor of Forest Soils and Biogeochemistry*; Soil Science, Ecosystem Ecology, Microbial Ecology, and Forestry.
- **James Dyer**, *Associate Professor of Geography*; Biogeographic patterns that emerge from the interactions of the physical environment, biotic processes, and disturbance, including the role of humans in altering climate and “natural” disturbance regimes and the implications for such change on biotic communities.
- **Patrick Hassett**, *Assistant Professor of Biological Sciences*; Marine and freshwater ecosystems. Physiology and feeding ecology of marine and freshwater zooplankton, particularly copepods.
- **Kelly Johnson**, *Associate Professor, Vice Chair, Department of Biological Sciences*; Entomology, environmental toxicology, watershed restoration, aquatic macroinvertebrates, biomonitoring and bioassessment, feeding ecology, stream ecology.
- **Natalie Kruse**, *Assistant Professor in Voinovich School of Leadership and Public Affairs*; watershed impacts, acid mine drainage.
- **Eung Seok Lee**, *Assistant Professor of Geological Sciences*; Contaminant hydrogeology, environmental monitoring and restoration, and carbonate-rock hydrogeology.
- **Dina Lopez**, *Associate Professor of Geological Sciences*; Geochemistry and hydrogeology of geothermal systems, including diffuse soil degassing and heat flow studies.
- **Brian McCarthy**, *Professor of Environmental and Plant Biology*; Population dynamics and community structure of eastern hardwood forests. Factors affecting seed production, dispersal, predation, germination, and seedling establishment.
- **Don Miles**, *Associate Professor of Ecology*; Adaptive significance of locomotory performance in lizards.
- **Guy Riefler**, *Associate Professor of Civil Engineering*; Biodegradation, Biotechnology and Bioengineering, Environmental Engineering Science, Environmental Science and Technology, Environmental Technology, Pesticide Biochemistry and Physiology, Quantitative Microbiology.
- **Willem Roosenburg**, *Associate Professor of Biological Sciences*; The evolution of life histories and population dynamics of vertebrates with environmental sex determination, conservation biology, restoration ecology.
- **Morgan Vis-Chiasson**, *Associate Professor of Environmental and Plant Biology*; Freshwater Algal Ecology and Evolution, Phylogenetic Systematics, Eastern Deciduous Forest Ecology.
- **Matthew White**, *Associate Professor of Biological Sciences*; Phylogeography, fisheries genetics, and conservation genetics of freshwater fishes.

Economics

- **Roy Boyd**, *Professor of Economics*; Natural Resources/Environment, Public Finance/ Coal Gas Emissions Modeling, International Trade and Development Policy.
- **Ariaster Chimeli**, *Assistant Professor of Economics*; Environmental economics, and economic development and the environment, with research focused on both theoretical models and applied work on environmental issues in the US, Brazil, Africa and the transition economies of Eastern Europe.
- **David Koonce**, *Associate Professor of Industrial and Systems Engineering*; Cost estimation, complex systems analysis.
- **Mark Weinberg**, *Professor of Political Science and Director of the Voinovich Center for Leadership and Public Affairs and the Institute for Local Government Administration and Rural Development (ILGARD)*; Strategic leadership, management and performance measurement in the public and nonprofit sectors. Public budgeting and financial management.

5. GRADUATE PROGRAMS ASSOCIATED WITH THE CENTER

The Center of Excellence draws faculty expertise from several departments across three Colleges – Arts and Sciences, Engineering, and Health and Human Services. The graduate degrees offered by these departments are listed in Table 1.

Table 1. Graduate programs for the Proposed Center of Excellence

Program	Enrollment (2008)	Master's Degree			Ph. D.		
		Grads 2006	Grads 2007	Grads* 2008	Grads 2006	Grads 2007	Grads 2008
College of Arts & Sciences							
Biological Sciences	60	5	8	2	9	7	4
Chemistry & Biochemistry	58	0	2	2	6	9	10
Environmental & Plant Biology	31	7	3	2	2	2	2
Economics	89	45	37	29			
Geography	27	10	6	6			
Geological Sciences	19	7	8	4			
Physics & Astronomy	80	10	8	4	12	9	5
Political Science	81	33	38	25			
Russ College of Engineering and Technology							
Chemical & Biomolecular Eng.	57	5	5	7	1	2	2
Civil Eng.	18	7	7	5			
Electrical Eng./Computer Science	103	17	11	9	9	8	3
Industrial & Systems Eng.	39	26	19	17			
Mechanical Eng.	25	19	13	16			
College of Health & Human Services and Voinovich School for Leadership and Public Affairs							
Environmental Studies	45	20	14	20			

Several of these programs were rated as excellent or very good by the Ohio University *Task Force on Centers of Excellence in Graduate/Professional Education*.

- Biological Sciences (M.S.), Excellent
- Biological Sciences (Ph.D.), Very Good
- Chemistry (M.S./Ph.D.), Very Good
- Environmental and Plant Biology (M.S./Ph.D.), Excellent
- Physics ((M.S./Ph.D.), Excellent

In terms of curriculum, Ohio University is the only public university in the state that offers a Master of Science in Environmental Studies. Faculties from every college have been involved with Environmental Studies in some capacity. Graduate students in Environmental Studies have recently been offered the opportunity to pursue an option in Environmental Leadership which prepares students for careers that bridge environmental studies and public policy. In addition, there is a new graduate certificate in Environmental Sustainability that is available to all graduate students at OU, as well as non-degree students.

6. PROFESSIONAL PROGRAMS ASSOCIATED WITH THE CENTER

There are no professional programs within the proposed CoE.

7. UNDERGRADUATE PROGRAMS ASSOCIATED WITH THE CENTER

The Center of Excellence draws faculty expertise from several departments across three Colleges – Arts and Sciences, Engineering, and Health and Human Services. The undergraduate degrees offered by these departments are listed in Table 2.

Table 2. Undergraduate Programs Associated with the Proposed Center of Excellence

Program	Enrollment (2008)	Graduates 2006	Graduates 2007	Graduates 2008 *	Graduates (3-year average)
College of Arts & Sciences					
Biological Sciences	913	110	89	78	92
Chemistry & Biochemistry	383	40	43	39	41
Environmental & Plant Biology	81	7	16	9	11
Economics	121	26	35	21	27
Geography	140	50	37	53	47
Geological Sciences	66	10	7	8	8
Physics & Astronomy	58	7	5	9	7
Political Science	430	125	115	104	115
Russ College of Engineering and Technology					
Chemical & Biomolecular Engineering	107	7	12	11	10
Civil Engineering	189	35	26	42	34
Electrical Engineering/Computer Science	166	52	33	38	41
Industrial & Systems Engineering	39	7	14	8	10
Mechanical Engineering	254	48	46	49	48
College of Health & Human Services					
Environmental Health Sciences	42				

Indicators of program strengths include:

- Thriving co-op program in engineering
- In terms of curriculum, multidisciplinary initiatives such as the Ohio EPA-funded, *Kanawha Environmental Education Project* (KEEP) is an innovative example of the sustainability of the Center of Excellence. The goal of KEEP is to enhance the undergraduate curriculum through faculty professional development by exposing faculty from diverse disciplines to environmental sustainability concepts and issues.

8. OUTSIDE COLLABORATING ENTITIES

One of the greatest strengths of the proposed CoE is its deep ties to other energy and environmental stakeholders – ranging from funding agencies to industrial partners in technology development. With over \$3 million per year in industrial funding, several royalty-generating licenses of intellectual property and management of national and internal research consortia, the proposed Center of Excellence will leverage its work and association with over 500 organizations to continue to develop new research, technologies, and opportunities for stakeholders. The list of affiliated companies is shown below.

Industry – partners in sponsored research or license agreements

- Southern Environmental Inc.
- Greenshift Cleantech
- American Municipal Power (AMP-Ohio)
- Green Bios
- Rolls Royce Fuel Cell Systems N.A.
- American Electric Power
- Cell Tech Power
- American Hydrogen Corporation
- Alstom
- Baker Petrolite
- BG Group
- British Petroleum
- Champion Technologies
- Chevron
- Clariant
- ConocoPhillips
- Encana Oil
- ENI
- ExxonMobil
- IONIK Consulting
- Nalco Energy Services
- Occidental Oil Company
- Petrobras
- PetroChina
- Petronas
- PTTEP
- Saudi Aramco
- Royal Dutch Shell
- Teikoku Oil
- Tenaris
- TOTAL
- AlgaeVentures

- Ohio Agrifuels
- Independence Bioproducts

Government, University or Non-Profit Agency partners in sponsored research

- The Ohio State University
- Case Western Reserve University
- Ohio Coal Research Consortium (CWRU, OSU, UT, UC, OHIO, and UD)
- Oak Ridge National Laboratories
- Argonne National Laboratory
- Utah State University
- Miami University (of Ohio)
- Research Triangle Institute (RTI)
- Ohio Coal Development Office
- Ohio Third Frontier Commission
- The Ohio Farm Bureau Federation
- The National Commission on Energy Policy
- The Bipartisan Policy Institute
- The Ohio Environmental Council
- Great Lakes Wind Network
- Policy Matters Ohio
- The Ohio Energy Project
- The Midwest Biodiversity Institute
- Rural Action
- Clean Fuels Ohio
- Ohio EPA – Many Divisions including Surface Water, Division of Environmental and Financial Assistance, Air Quality, Director’s Office
- ODNR – Many Divisions Including, Mineral Resources Management, Soil and Water, Forestry, Wildlife, Geology
- The Mid-Ohio Regional Planning Commission (MORPC)
- Solid Waste Authority of Central Ohio (SWACO)
- PUCO
- The Ohio Department of Development
- Ohio Energy Office
- Governor’s Office of Appalachia
- Appalachian Regional Commission
- Edison Welding Institute

9. SUPPORTING SCIENTIFIC, SCHOLARLY AND/OR CREATIVE ACTIVITIES

The faculty and staff affiliated with the proposed Center of Excellence have received multiple million-dollar externally funding grants, usually involving multiple research institutions, as principal investigators. In addition, they average 21 refereed publications apiece in the energy and environment fields, with several named as Fellows of their professional societies or editors of leading journals in their fields. Supporting scientific and scholarly activities are detailed in faculty and staff biosketches (see II.C).

10. MANAGEMENT PLAN

Because the proposed Center of Excellence involves multiple colleges, departments, schools, and institutes, the “management” inherently falls to the Dean, Chairs and Directors of the respective organizations that control the funding and faculty lines. However, day-to-day fiscal tracking, activity facilitation, and reporting must be centralized to optimize the responsiveness of the proposed Center of Excellence to the needs of its stakeholders.

With the creation of the Consortium for Energy, Economics and the Environment (CE3) in 2005 Ohio University developed the infrastructure to promote interdisciplinary collaboration, creation of external alliances, engagement of stakeholders, and manage the internal funding of inter-disciplinary and inter-college research and economic development activities in energy production and environmental monitoring and remediation. CE3 employs a director to oversee such activities, as well as the coordination of fiscal and metric reporting across academic units.

Management of proposed Center for Excellence in Energy and the Environment will consist of the following aspects:

- The existing CE3 infrastructure and Director will manage the day-to-day programmatic and fiscal reporting activities of the proposed Center of Excellence.
- The Director will form task groups around research and development activities, with each task group having a Chair that will work with the Director. In addition to the investigators, these task groups will also consist of chairs and directors from each of the represented colleges, departments and institutes (or their appointed representatives). Task groups will meet as needed to facilitate proposal development and research activities.
- The Deans of the Russ College of Engineering and Technology and the College of Arts and Sciences, the Director of the Voinovich School, and the Vice President for Research will be the controlling authority of the CoE. Along with the Director that they appoint, they will comprise the Executive Leadership Committee (ELC) overseeing all financial and strategic decisions. The Executive Leadership Council will meet at least twice per year and will submit a report on expenditures and progress against metrics to the Board of Trustees and Board of Regents.
- The Center of Excellence in Energy and the Environment will employ an Advisory Board composed of representatives from industry, government, and economic development organizations to evaluate and guide the activities of the CoE. The Advisory Board will meet at least once per year.

11. RESOURCE MANAGEMENT AND FUNDING PLAN

Resource Management

The Executive Leadership Committee (ELC) will be responsible for the overall management of the Center of Excellence program, including fiscal decisions. Such oversight is needed because the CoE will require capital investment to respond to the need for new assets or improvements to assets that will achieve Center of Excellence objectives. Potential investments include faculty lines, post-doctoral and research engineers, laboratory technicians, graduate students, and administrative personnel, as well as facilities renovations, and equipment purchases.

The ELC, in consultation with the university community and agreement by the Board of Trustees and the Board of Regents, will develop a five-year resource management and funding plan prior to the establishment of the Center of Excellence. The ELC or their designate(s) will be responsible for reviewing proposed project expenditures to ensure they are justified, assessing proposed funding plans for feasibility, and reviewing projects for consistency with program and university priorities.

Funding Plan

Ohio University has identified four funding areas to provide resources for the proposed Centers of Excellence. Those areas are:

1. Major capital projects to provide necessary facilities. The capital projects include an energy and environment campus on the university's West State Street location. This is already the site of the Corrosion Institute and many ISEE labs.

2. Upcoming university capital campaign. The Executive Leadership Council has already defined development targets for the capital campaign that include three named chairs for energy and the environment plus endowed graduate stipends to support the core faculty members.
3. Continuing and new partnerships with industry and business. Energy and the environment research received \$28M in external funding over the last five years. This occurred when CE3 and its interdisciplinary relationships were being formed. With a more mature organization, external funding is expected to increase. Additional funding will also be generated from licensing intellectual property to industry and business. The addition of an Ohio Research Scholar will aid significantly in this area. Moreover, core faculty are currently responsible for \$400,000 per year in research expenditures. Ohio University expects to double the number of core faculty participants, with a corresponding level of activity. Thus, it is not unreasonable to expect \$50M in expenditures over the next five years.
4. Reallocation of existing resources and generation of new resources through Ohio University's *Vision Ohio* implementation plan. As a CoE, energy and the environment will benefit from resource allocation plan defined in *Vision Ohio*.

12. SPONSORED PROGRAM ACTIVITY ASSOCIATED WITH THE CENTER

Ohio University has worked with shareholders to aid in the creation of public policy in the energy and environmental areas, as well as help lead the direction of such research through participation and leadership in several organizations. Two specific examples are listed here, others can be found in Appendix II.D.

The University Clean Energy Alliance of Ohio

Ohio University is a founding member of, and has become an integral part of the University Clean Energy Alliance of Ohio (UCEAO) a coalition of 15 public and private universities from around the state who have united to meet the growing need for clean energy alternatives for the 21st century. To date Ohio University's involvement with the group consists of chairing the planning committees for the first three annual UCEAO conferences that each pulled together more than 200 researchers and students from around the state, serving as Vice-Chair for the organization, and advising the Ohio Department of Development's Third Frontier Commission in the method and manner for providing match funding for a large Department of Energy Center grant program. CE3 was integral in lining up Governor Strickland to give the keynote address at the April 23, 2007 meeting. In addition to the Governor, Chancellor Eric Fingerhut addressed the crowd and challenged the group to find new ways to work together to solve the State and the Nation's energy issues.

The 2008 annual meeting, with the theme of Green Industrialization, drew in more than 240 participants, exhibitors, and paying sponsors including Battelle Labs, American Electric Power and NASA Glenn Research Center. This meeting also saw the group expand its offerings to include a student poster session that included more than 75 students and faculty from member institutions. The 2009 conference included an evening reception and keynotes by Kathleen McGinty, former Chair of the White House Council on Environmental Quality under President Clinton and by Lieutenant Governor Lee Fischer.

Energy Independence Workshop

On March 3, 2006 Ohio University's CE3 cosponsored a workshop entitled "Ohio: Securing America's Energy Future" along with Senator George Voinovich. The meeting included more than 120 experts from Ohio and throughout the Midwest. The workshop focused on reducing America's reliance on foreign sources of energy and identifying opportunities and obstacles for Ohio to increase its competitive advantage in the development and deployment of technologies that will increase our energy security. Results from the four breakout sessions: Alternative Energy, Fossil Fuels, Transportation, and Sustainable Development have informed the development and deployment of Ohio's new electricity restructuring plan, S.B. 221, and other corresponding pieces of legislation. A recent update of that plan in Spring 2009 indicates that as many as 1/3rd of the 150 policy recommendation in this report have been enacted and put into law.

13. SUGGESTED METRICS THAT DEFINE EXCELLENCE FOR THE CENTER

We have selected the metrics, listed below, from the Regents list. In addition, we propose an additional metric related to successful outcomes of environmental remediation.

World Class Academic Talent (Inputs)

- Total research expenditures
- Federally financed research expenditures
- Faculty awards
- Private investment into program (both capital, research, and any other private giving)
- Referenced publications per faculty member
- Number of doctorates awarded per year
- Number of post docs currently employed

Connection to the industry's local economy (value added)

- Licenses and options executed (number of deals)
- Industrially financed research expenditures
- Invention disclosures
- Number of companies that have relationships with the Centers of Excellence
- Average salary of jobs created in the region or state in industries related to the center of excellence
- Jobs created in the state or region in industries related to the center of excellence.
- New Green industries located in the region.

Economic Impact (outputs)

- Jobs in region for the cluster
- Average salary for jobs in this cluster
- Economic output of the cluster in region
- License income
- New Green industries located in the region (Third Frontier)
- Companies attracted, created and capitalized in this industry in the region (Third Frontier)
- Expanded regional market (Ford Foundation)
- Bolstered business growth (Greater Ohio)

In addition, we would like to offer under “Connection to the industry's local economy (value added)” metrics for environmental impact, or some version of the metrics below to give a better idea of the full value of the work by the proposed CoE:

- Regional and statewide environmental improvement
 - River miles improved
 - Watershed plans completed/in progress
 - Air quality improvements
 - Environmental education/training/outreach projects completed/in progress
 - Innovations in environmental monitoring



Center of Excellence Proposal for Health and Wellness: From Translational Research to Best Practices for Rural/Underserved Populations

1. CENTER OF EXCELLENCE CONCEPT

The leadership of Ohio University (OU), in consultation with the Board of Trustees, proposes the designation of a Center of Excellence, *Health and Wellness: From Translational Research to Best Practices for Rural/Underserved Populations*. OU possesses strengths in the areas of biomedical research, in healthcare education, in clinical and outreach programs, and in bringing innovative treatment methodologies to the world. Through these activities, OU is a leader in the state and region in addressing a broad spectrum of health and wellness issues.

Because OU's home is in southeastern Ohio, many of our programs and services are directed toward the rural, underserved population that resides here. Thus, more than any other institution in Ohio, OU has been successful in using a community focus to create an effective health and wellness continuum. The continuum brings together nationally influential research, local wellness programming, clinical outreach, and regional economic development-- manifested in the creation of new medical products, biomedical companies, healthcare practices, and enhanced workforce productivity through access to quality healthcare. The excellence that is at the heart of OU's proposed center resides in its ability to unite all of these elements together in a health and wellness continuum that is unique in the state and in the region.

The continuum reflects in many ways the concept articulated by the NIH Roadmap for Medical Research that "to improve human health, scientific discoveries must be translated into practical applications. Such discoveries typically begin at 'the bench' with basic research—in which scientists study disease at a molecular or cellular level—then progress to the clinical level, or the patient's 'bedside.'" ⁴⁶ At OU, the NIH concept of advancing healthcare is taken one step further. Our continuum is bench to bedside to community and beyond. It reflects dedication to integrated health care that is at the heart of the developing academic health center at the university.

The scale of OU and the fact that it is physically immersed in the southeastern Ohio and Appalachian population has allowed the institution to create a unique approach to promoting good physical and mental health in a region that has been chronically underserved and rife with special health care needs. An array of centers, institutes, and faculty across several colleges is actively engaged in addressing the specific health and well-being needs of this population.

Surveys of counties surrounding OU conducted by the Appalachian Rural Health Institute have concluded that the prevalence of diabetes, cancer, heart disease, emphysema, high blood pressure, and depression often exceeds state and national norms. Not surprisingly, this research has also revealed a high incidence of significant health risk factors such as high cholesterol, tobacco use, low activity levels, and high body mass index.⁴⁷ In response to these trends, OU faculty across a wide range of healthcare fields and disciplines have joined together to create and

⁴⁶ "Reengineering the Clinical Research Enterprise," NIH Roadmap for Clinical Research
<http://nihroadmap.nih.gov/clinicalresearch/overview-translational.asp>

⁴⁷ Appalachian Rural Health Institute, "Health Needs Assessment Survey II: Report of Findings," (June 2006, Institute for Local Government Administration and Rural Development); Appalachian Rural Health Institute, "Health Needs Assessment Survey: Report of Findings (June 2004, Institute for Local Government Administration and Rural Development)." Both reports are available at <http://www.oucom.ohiou.edu/arhi/research.htm>

implement strategies in the clinic, in the research lab, in schools, and in the home to treat disease and lower health risks.

The work of skilled clinicians and other health care practitioners is enhanced by prominent research scientists such as John Kopchick, Ph.D., Goll-Ohio professor Molecular Biology and Eminent Scholar. Kopchick and other faculty engaged in biomedical research enable OU to push for breakthroughs in treatment and technology. His current work aims to help uncover molecular mechanisms behind diabetes and cancer, two of the diseases that are overrepresented in the Appalachian population.

Some of that work may bring additional dividends to the state. Kopchick pioneered the discovery of a growth hormone receptor antagonist that led to the development of the FDA-approved drug Somavert (Pfizer), which treats acromegaly, a chronic disease caused by excessive secretion of growth hormones. To date, ~2500 patients have been treated with sales in excess of \$14 million per year and total royalties to OU exceeding \$19.8 million.

According to *Forbes* magazine, OU is ranked 4th in the country for the amount of license revenue generated in relation to research funding. This is in large part due to an existing university infrastructure that is capable of identifying and nurturing the intellectual property of the institution. That infrastructure will allow researchers to bring new diagnostics and therapeutics for endocrine and other diseases, including cancer, to market; thereby creating the potential for new royalty income that can further research, clinical, and outreach efforts.

Success in the medical marketplace can also improve the state's economic outlook through the establishment of companies such as Diagnostic Hybrids Inc. Due in part to technology developed by university biomedical researcher Len Kohn, Diagnostic Hybrids, an international biomedical technology company based in Athens, doubled its revenues and almost tripled its workforce in 4 years.

The approach of bench to bedside to community and beyond offers a means of improving the lives of thousands of Ohio citizens as well as strengthening the state's economy.

Bench to Bedside to Community and Beyond: Diabetes as an Example

The bench to bedside to community and beyond approach that characterizes OU's proposed Center of Excellence can be illustrated by the university's work on diabetes. An estimated 23.6 million individuals in the United States have diabetes; of these, more than one million reside in Ohio. The incidence of diabetes has increased in Ohio from 5.8% to 9.5% between 1998 and 2007. The resulting costs, both direct (medical care) and indirect (lost productivity), total \$174 billion nationally and \$5.9 billion in Ohio, and are exacerbated by serious comorbidities and complications associated with diabetes, e.g., blindness, kidney damage, and lower-limb amputations. Productivity losses are magnified when one considers the additional lost productivity among family members who take on care-giving responsibility for these individuals.

Numerous OU faculty are engaged in direct outreach to the citizens of southeastern Ohio who struggle with diabetes. Through a diverse array of programs, research, and teaching these faculty work to enhance the quality of life and the well-being of individuals and families. Students who study healthcare at OU learn to use diabetes and its progression as a framework for understanding the onset and treatment of disease as well as how health and well-being can be achieved in an underserved and economically challenged population. Undergraduates, graduate students, and medical students participate in diabetes research and outreach, and units in the proposed center of excellence are in the process of developing an interdisciplinary diabetes certificate program.

In the area of biomedical research, there is a strong core of faculty working on diabetes at OU. One of these faculty members is Frank Schwartz, MD FACE, professor of endocrinology, James O. Watson Endowed Diabetes Research Chair, and a practicing endocrine medical specialist with expertise in the treatment of Type 1 diabetes. In 2005 Schwartz started the Diabetes/Endocrine Diseases Biorepository to store patient blood samples, including serum, DNA and RNA, which will assist researchers at OU and elsewhere to study the causes of obesity, diabetes, atherosclerosis, cancer and other endocrine diseases for the purpose of exploring better treatment and diagnostic possibilities.

The work of the bench has become part of the bedside and the community via Schwartz's interactions with a group of his colleagues who provide primary care and health education outreach through the Appalachian Rural Health Institute (ARHI) Diabetes Coalition. The Coalition is a group of diabetes educators, nurses and governmental agencies that supports research into cultural and economic barriers to healthcare access and education. Coalition members have participated in an intervention program to study and address the impact and treatment of depression in patients with Type 2 diabetes. This outreach program is the direct result of an earlier, NIH-funded research project in which OU faculty researchers examined exercise as a coping mechanism for depression among diabetic patients.

Another ARHI initiative is the Diabetes Toolkit, which moves away from using an exclusive medical model and traditional forms of diabetes education by focusing on diabetes and diabetes prevention and care needs from family perspectives. While anyone may use the Toolkit, it has been especially crafted for those living in the Appalachian region. Partially funded by the Centers for Disease Control and federal appropriations, educational toolkits will be made available through the ARHI Diabetes Center and through local health centers. The work of these individuals reflects OU's focused commitment to health and well-being in the rural, underserved communities of the region.

The bench to bedside to community and beyond paradigm that exists for diabetes is applicable also to cancer, mental health, heart disease, and other health and wellness concerns that have undercut the longevity, productivity, and quality of life for generations of Appalachian Ohioans. OU's proposed Center of Excellence is a continuum that unites knowledge, experience, creativity, and compassion. It is a model that will benefit the health and well-being of the state's citizens and its economy.

2. SCOPE OF ACTIVITIES

OU's educational legacy has been integral to enhancing the health and wellness of residents, not only in Ohio but also in other regions and nations. The College of Osteopathic Medicine was established in 1975 by an act of the Ohio General Assembly to help relieve the state's growing shortage of family physicians and to train doctors to practice in medically underserved areas in Ohio. The College of Health and Human Services was established in 1979 to prepare healthcare and related professionals and researchers. Today OU provides health care services to the community through a variety of platforms – from hospital settings to clinics to mobile van service. OU also plays an integral role in healthcare workforce development – from doctors to nurses to other healthcare professionals.

The development of the proposed center stems from strategic decisions made over the course of five years connected to Vision Ohio, the University's academic plan, and the university's recently completed comprehensive evaluation of all graduate and professional programs. It also draws from the Battelle Memorial Institute report on the state's research core competencies and the critical role that the university plays as a healthcare educator and provider in the region.

In 2006, the Ohio Board of Regents and the Ohio Department of Development commissioned Battelle Memorial Institute to assess the State's research core competencies. (See report "Positioning the State of Ohio For Economic Growth: Strategically Aligning Ohio's Research and Technology Portfolio.") The report was based on an extensive analysis of academic and industrial strengths in Ohio and identified OU as having significant research strength in two of the bioscience platforms: Experimental Therapeutics & Diagnostics and Agbioscience, with specific disease and disorders and basic science expertise in:

- Cancer
- Neuroscience
- Infectious Diseases
- Cardiology/Cardiovascular/Cardiopulmonary
- Animal and Agbioscience
- Genetics and Genomics
- Cellular and Molecular Biology
- Biomedical Imaging
- Computational and Personalized Medicine
- Structural biology

The materials appended to the Battelle report also identified diabetes and endocrinology as strengths at OU.

University strategic planning and the development of a set of competencies has determined core objectives for the proposed Center of Excellence:

- Create synergistic, interdisciplinary teaching and research opportunities to produce high impact, extramurally-funded research;
- Educate highly-qualified researchers, practitioners, communication experts, policy makers;
- Expand entrepreneurship in healthcare technologies and implement innovative models of health care delivery;
- Engage community partners in identifying high priority healthcare, educational, research, policy and other needs; and
- Supply health care to rural populations in Appalachian Ohio, assist in health care development in underserved communities in the state and internationally, and educate medical professionals serving the state, the nation and the world.

Indicators demonstrating significant strengths of the proposed Center of Excellence are summarized below:

- Extramural funding (2004-2008): \$28.14 M
 - Endocrine diseases: \$8.01 M
 - Cancer: \$2.84 M
 - Infectious diseases: \$3.47 M
 - Neuroscience: \$5.76 M
 - Agbioscience: \$2.33
 - Health & Clinical Psychology: \$5.70 M
- Researchers: >57 – from the Colleges of Arts & Sciences, Health & Human Services, Osteopathic Medicine and Engineering and the Edison Biotechnology Institute.
- Intellectual Property Portfolio: 114 invention disclosures, 62 patent applications, 29 patents.
- License Royalty: *Forbes* magazine ranked OU 4th in the country for the amount of license revenue generated in relation to research funding. Royalty fees garnered by OU from Somavert (John Kopchick) (FY05-08): \$14.5 M.
- Workforce Development: Due in part to technology developed by University researcher Len Kohn, Diagnostic Hybrids, an international biomedical technology company based in Athens, doubled its revenues and almost tripled its workforce in 4 years.
- Clinical Outreach: Health services and education delivered *in local community settings* to more than 180,000 people (measured as encounters) per year throughout a 21 county region.

Center of Excellence Foci

Within the continuum of bench, bedside, community and beyond, the proposed center has three foci: (1) translational and clinical research, (2) innovations in health education and (3) community health services.

Translational and Clinical Research Focus

For the purposes of this proposal we use the NIH definitions of translational and clinical research. Translation research is "the process of applying ideas, insights, and discoveries generated through basic scientific inquiry to the treatment or prevention of human disease." Clinical research is "patient-oriented research, including: (a) mechanisms of human disease, (b) therapeutic interventions, (c) clinical trials, and (d) development of new technologies." Through close collaborations, basic research scientists provide clinicians with new diagnostic and therapeutic tools for use in patient care and for assessment of their impact, and clinical researchers make novel observations about the nature and progression of disease that often stimulate basic investigations. OU has basic science and clinical research expertise across several diseases and disorders, as noted in the Battelle Report, and an outstanding record of clinical outreach and economic development success as detailed below.

Exemplar Activities

Frank Schwartz, in collaboration with researchers at the Edison Biotechnology Institute, Interthyr Corporation and Diagnostic Hybrids Inc. is examining the abnormal expression of genes and proteins throughout the progression of diabetes and related endocrine diseases (Graves' Disease/Hashimoto's Thyroiditis), obesity and its link to cancer. The goal of these studies is to develop new diagnostics and therapeutics. In this regard, the team is developing a novel therapeutic that blocks abnormal expression of toll-like receptors (TLR) and may offer a new type of treatment for autoimmune diseases such as Type 1 diabetes, atherosclerosis and certain cancers that pathologically express TLR in the near future. To date, the project is in preclinical testing and has received funding from Interthyr and a Phase I STTR grant from NIH, and was recently awarded a \$2.7 million Phase II STTR grant.

In collaboration with **Cynthia Marling**, Ph.D. from the Russ College of Engineering and Technology under a sponsored agreement with Medtronic MiniMed Inc., Schwartz is also working to improve medical technology for diabetic patients by co-developing an artificial intelligence software program for insulin pumps for type 1 diabetes patients. The software interprets how lifestyle trends impact individual patients' glucose levels and offers evidence-based solutions to problems.

John Kopchick is working with **Marcia Kieliszewski**, Ph.D., Professor of Chemistry and Biochemistry, to develop a second-generation Growth Hormone Receptor antagonist in the same class as Somavert produced in cultured plant cells (agbioscience).

Kopchick, **Ed List**, Ph.D., Research Associate of the Edison Biotechnology Institute, and **Darlene Berryman**, Ph.D., Associate Professor of Human and Consumer Sciences, are working on the effects of growth hormone on insulin signaling and aging. In collaboration with Southern Illinois University, the team received a National Institute of Aging PO1 grant totaling \$10M.

Rathindra Bose, Ph.D., a professor with joint appointments in Chemistry & Biochemistry and Biomedical Sciences, has developed a new class of anti-cancer platinum compounds called phosphaplatins that exhibit increased efficacy and reduced toxicity. These compounds are highly effective against resistant-ovarian and head cancers. Phosphaplatins activate proapoptotic cell surface genes and largely kill cancer cells. Unlike conventional drugs that bind DNA and interfere with the functions of intra-cellular enzymes leading to side effects such as hearing and hair loss and kidney dysfunction, phosphaplatins appear to exhibit minimal toxicity. These compounds are currently being tested in animal models to assess tolerability and efficacy.

Ben Ogles, Ph.D., Professor of Psychology developed the Ohio Scales, the mental health evaluation measure used to assess outcome for children receiving publicly funded mental health services state-wide in Ohio that has been adopted by several other states (e.g., Illinois, Texas, Connecticut, Washington).

Christopher France, Ph.D., Professor of Psychology and recently elected President of Division 38 (Health Psychology) of the American Psychological Association, conducts research on interventions to educate blood donors about the blood donation process and to improve the chances of a positive blood donation experience. His method has been adopted for use with high school blood donors throughout the U.S.

Steve Evans, Ph.D., Professor of Psychology develops and evaluates practical school-based interventions for adolescents with ADHD and related problems. His primary focus is in the development and evaluation of school-based interventions that include family components and may be coordinated with medication treatments. Multi-component treatments are emphasized that address the breadth of problems experienced by this population including substance use, academic impairment, vocational challenges, and difficulties forming relationships with peers and adults.

Chris Gidycz, Ph.D., Professor of Psychology has developed a sexual violence prevention protocol that has been administered to thousands of Ohio University students; her work has informed the efforts of others working on college campuses as well as United States Air Force personnel.

Ken Holroyd, Ph.D., Distinguished Professor of Psychology, coordinates an interdisciplinary team of research scientists and clinicians with two primary goals: (1) to understand the psychobiological mechanisms of chronic pain, and (2) to develop and evaluate new interventions to more effectively prevent and treat chronic pain problems. Dr. Holroyd's development of effective self-management strategies for headache pain has garnered broad national and international recognition.

Brooke Hallowell, Ph.D., Associate Professor of Speech and Language Sciences, is developing an innovative eye-tracking method to assess comprehension in post-traumatic and post-stroke patients and conducting research on multinational aphasia management practices.

Michael Kushnick, Ph.D., Associate Professor of Exercise Physiology, is collaborating with Purdue University in investigations of metabolic response to novel carbohydrates. He has collaborated with Drs. Shubrook, Schwartz, deGroot and others on the effect of interventions on diabetes prevention and control, and conducts a wide range of physiologic studies pertaining to exercise, blood pressure, and obesity.

James Thomas, Ph.D., Associate Professor of Physical Therapy, in collaboration with Christopher France is determining how physical and psychological factors interact in the recovery process following an episode of initial low back pain. In addition to his studies of low back pain, he has several publications pertaining to neuromuscular disorders affecting gait, arm movement, trunk muscle activity, as well as coordination and timing of spine and hip joints during movement.

Li Xu, Ph.D., Associate Professor Hearing Sciences, is conducting investigations of tone perception and production in prelingually deafened native tone-language speaking children, as well as the functional effects of specific spatial and temporal configurations on the electrical stimulus in cochlear implants.

Innovations in Health Education Focus

Distinctive features of OU's health education programs include opportunities for interdisciplinary training, an integration of research experiences with clinical education, and wide exposure to supervised practice not only in rural Appalachia but also in underserved international communities.

For example, the Psychology and Social Work Clinic pursues excellence in graduate education by exposing students to cutting-edge and progressive treatments. The undergraduate speech-language pathology program has an Undergraduate Research Club and places exemplary students in the Honors Tutorial College. The College of Health and Human Services offers an interdisciplinary Gerontology Certificate and a unique Graduate Certificate Program in African Community Health. Numerous CHHS programs offer a thesis option to engage students in original research such as the impact of gardening and nutrition education on food insecurity in impoverished regions of Appalachia, obesity and health risk factors in employees in rural Appalachia, and the effects of nutrition education and physical activity on children with metabolic syndrome in Appalachian Ohio.

Exemplar Activities

The College of Health and Human Services' Kids on Campus (KoC) provides afterschool and summer enrichment programs designed to enhance literacy, health, nutrition, and physical activity in Athens and surrounding counties, directly serving over 600 children each year in before- and after-school programming and a summer academy on campus. This program is targeted toward economically disadvantaged children from rural southeastern Ohio. Now

in its 14th year, the KoC program has achieved \$7,698,856 in external funding from federal, state, and philanthropic sources 2004-2008.

Numerous health-related academic programs at OU have employed innovative designs and enjoyed great success. For example, the learning environment at the OU College of Osteopathic Medicine (OU-COM) is constructed based on the principles of adult learning which include student empowerment and clinical relevance. Students enrolled in OU-COM study in one of two tracks—the Patient-Centered Continuum (PCC) or the Clinical Presentation Continuum (CPC) curriculum. Notably, (OU-COM) Classes of 2007 and 2008 collectively earned both the highest national mean score and the second highest national first-time passage rate in the most recent Comprehensive Osteopathic Medical Licensing Examination (COMLEX-USA) Level Three.

The Athletic Training program was the first in Ohio to offer a post-professional masters of science degree for athletic trainers. Similarly, in 1994, the Masters of Physical Therapy was the first to be approved by the Ohio Board of Regents and, in 2003, was the first to offer the Doctor of Physical Therapy degree. The School of Hearing, Speech, and Language Sciences offers two highly-ranked professional degrees, representing only two of four graduate programs at OU that are among the top 40 in their fields, and the School is ranked first of 11 comparable programs in Ohio.

The College of Health and Human Services has several programming initiatives in cooperation with OU's regional campuses including the R.N. to B.S.N. at three regional campuses, a Bachelors of Health Administration at two regional campuses, and an Exercise Physiology program at one regional campus. A proposal has been developed for a Bachelors in Integrated Health Sciences by the School of Public Health Sciences and Professions. In 2008-2009, the School of Nursing began a new online R.N. to B.S.N. program in partnership with numerous hospitals in Ohio. This two-year program is marketed to Ohio and contiguous states. Enrollment was 400 students during the first quarter and is projected to increase to 2,000 students.

OU, through interdisciplinary collaborative programs with over fifteen African countries (e.g. Ghana, Nigeria, Sudan, Kenya, Uganda, Botswana, Zimbabwe, South Africa) facilitates partnerships for the exchange of technological information between the African Universities and OU's School of Public Health Sciences and Professions (Matthew Adeyanju, Ph.D., Director). These collaborative endeavors, aimed at teaching and technological exchanges among and between students and faculty in Africa and at OU, are made possible through the use of live internet video conferences, on-line group discussions, and a "Global Online Learning" email system. The School offers the Graduate Certificate Program in African Community Health Services—the only one of its kind in the United States.

Community Health Services Focus

OU is distinguished by a range of clinical services for the rural community of Ohioans who often lack transportation or insurance for care that they need. OU's Area Health Education Consortium (AHEC) directly serves 13 counties (Athens, Belmont, Gallia, Harrison, Jackson, Jefferson, Lawrence, Meigs, Monroe, Morgan, Noble, Vinton, Washington) while OU-COM's Community Health Programs serve a total of 21 southeastern Ohio counties. OU Therapy Associates reaches several thousand Appalachian patients annually for provision of hearing aids, speech-language therapy, physical therapy, and sports-related injuries (see details in Section 12 below). The examples below illustrate OU's commitment to providing a range of community health services.

Exemplar Activities

The AmeriCorps/ComCorps program annually serves 35,979 Athens County children and adults (measured as encounters), offering lice and vision screenings, health-care transportation, health education, Healthy Start support and referrals to area health-care providers. The program is funded by the Ohio Community Service Council through federal support by the Corporation for National Community Service. Service volunteers are located at fourteen partner sites. Upon completing a year of service, they are paid a living allowance and receive loan

forbearance and an educational award.

Funded by the Ohio Department of Health, the Childhood Immunization Program (CHIP) serves more than 8,000 people annually from 21 Southeast Ohio counties. Regardless of income or insurance status, children 0-18 years of age receive free immunizations and assistance with kindergarten registration, and adults have access to county-wide flu clinics, regional hepatitis B immunization clinics, parent education, and referral services.

Through the Community Health Program, OU-COM provides free clinic and low cost health care services. The Free Clinic provides free medical episodic care and ongoing diabetic management care for adults 18-64 without insurance and at 150% of the poverty rate. Approximately 350 patients were logged in 2008, with prescriptions covered at a value of more than \$25,000.

The Youth Experiencing Success in Schools (Y.E.S.S.) Program is a school-based project designed to increase access to evidence-based services for children and families in Southeast Ohio who struggle with inattention and disruptive behavior problems. The program recently won a national award from the Annapolis Coalition related to integrating mental health intervention into the school system.

Ohio University Respite Volunteer Program (OURVP) is an outreach program of the School of Hearing, Speech and Language Sciences that involves a network of two graduate student coordinators, a faculty supervisor, and over 50 trained volunteers who provide free in-home relief to caregivers of elderly people. Those served have a variety of disabilities, although the program has a special focus on Alzheimer's disease and related disorders.

Established in 1997, SHARE Kenya is 3-week clinical program in which 50 students, faculty and clinicians deliver healthcare in rural Western Kenya. The SHARE Kenya-Ohio involves medical students and advanced pharmacy, nursing and physical therapy students and licensed physicians, nurses, pharmacists, and physical therapists. Last year 50 volunteers provided service to more than 3,000 patients.

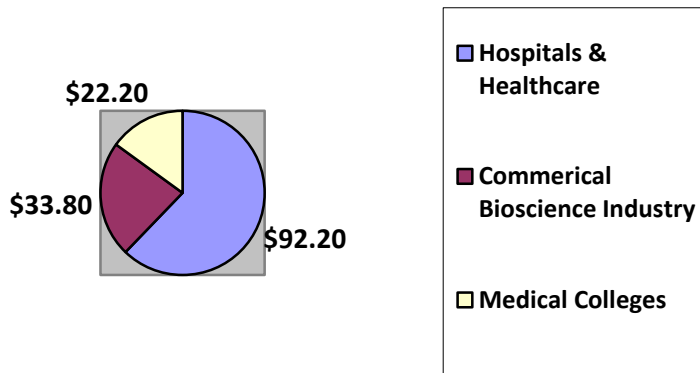
3. PROSPECTS FOR DRIVING ECONOMIC ADVANCEMENT

The Center of Excellence has the potential to directly drive economic advancement through workforce development and commercialization of technologies.

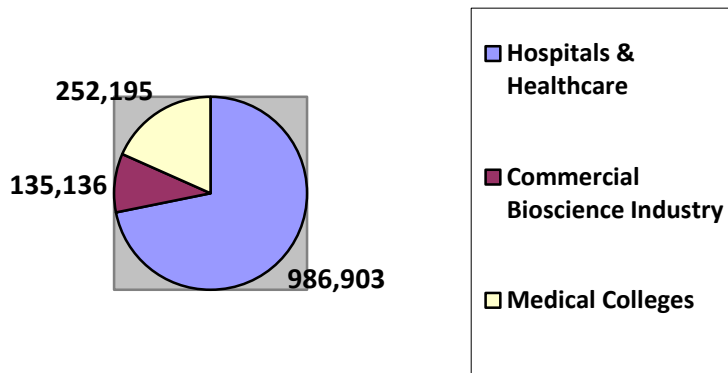
Workforce Development

Academic programs within the Center of Excellence produce a diverse workforce capable of entering several segments within the overall bioscience industry. According to the Ohio Bioscience Growth Report 2007-2008, the bioscience industry, which comprises commercial bioscience, medical colleges and hospitals and healthcare providers, *directly and indirectly* generates nearly 1.4 million jobs in Ohio, representing 1 in every 4 Ohio workers. The total economic impact of Ohio's bioscience industry in 2007 was \$148.2 billion. This represents 15.7% of Ohio's total economic output of \$941.8 billion. The contributions of the individual sectors to the economic and employment impact are summarized below.

2007 Statewide Economic Impact (billions)



2007 Statewide Employment Impact



The *direct* economic impact of the Ohio commercial bioscience industry, as reported by segment, is summarized below. Agbio, pharmaceuticals and medical devices continue to be dominant industry segments.

Segment	2007 Direct Economic Impact	2007 Direct Employment Impact
Agbio	\$10.7 billion	5,840
Pharmaceutical & Therapeutics	\$2.7 billion	5,074
Medical Device & Equipment Manufactures	\$2.8 billion	9,757
Research & Development	\$1.6 billion	12,415
Medical Laboratories & Diagnostic Imaging Centers	\$929 million	7,570
Testing Laboratories	\$712 million	5,843

Each year (based on a three-year average of graduation data), OU grants more than 95, 166, and 699 degrees from the graduate, health professional and undergraduate programs designated within the Center of Excellence (See

Sections 5-7). The Center of Excellence’s emerging strengths are in areas that, according to economic predictions, will experience growth and create new jobs, including several identified by the Ohio Department of Job and Family Services as “Occupations with High Employment Prospects in Ohio.” Five of the 10 occupations requiring a master’s degree and two of the four occupations requiring a doctoral degree listed are within the areas of the Center of Excellence. Community and Social Service focusing on health and Health Care jobs also accounts for 50% of the Buckeye Top Fifty High Wage Occupations in Ohio⁴⁸ – with average annual earnings of more than \$58,000.⁴⁹ Individual and family services, home health care services, community care facilities for the elderly, residential mental health facilities, and outpatient care centers sectors are five of the eight “high employment prospect” industries that are projected to have both a high rate of growth and a large number of annual openings, according to the Ohio Department of Job and Family Services.⁵⁰

Occupations with High Employment Prospects in Ohio, Requiring a Bachelor’s Degree⁵¹

SOCCode	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average Wage, May 2007	OU Degree Program
19-2031	Chemists	3,490	3,540	1.4%	97	\$30.17	Chemistry
19-4021	Biological Technicians	2,350	2,710	15.3%	120	\$16.20	Biol. Sci.; EPB
21-1022	Medical and Public Health Social Workers	5,970	7,430	24.5%	272	\$20.68	Psychology; Social Work
21-1091	Health Educators	1,610	2,030	26.1%	61	\$20.63	Nursing; Psychology
29-2011	Medical and Clinical Laboratory Technologists	6,580	7,290	10.8%	170	\$23.65	Biol. Sci.; Chemistry
29-9011	Occupational Health and Safety Specialists	1,920	2,060	7.3%	51	\$32.54	Biol. Sci.; Chemistry; PHSP

EPB, Environmental and Plant Biology; PHSP, Public Health Sciences and Professions

Occupations with High Employment Prospects in Ohio, Requiring Work Experience plus a Bachelor’s* or Higher Degree or Requiring a Master’s Degree^{†52}

SOC Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average Wage, May 2007	OU Degree Program
11-9111	Medical and Health Services Managers*	10,910	12,550	15.0%	368	\$37.40	PHSP; RSS
19-2041	Environmental Scientists/Sp	2,720	3,070	12.9%	105	\$28.93	Biol. Sci.; EPB; Env. Studies;

⁴⁸ Does not include education, as employment spans several degrees.

⁴⁹ Ohio Department of Job and Family Services, <http://ohiolmi.com/proj/projections/ohio/Buckeye50.pdf>

⁵⁰ Ohio Department of Job and Family Services, <http://ohiolmi.com/proj/Projections/Ohio/OhioJobOutlook.pdf>

⁵¹ Ohio Department of Job and Family Services, Bureau of Labor Market Information (November 2008).

⁵² Ibid.

SOC Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average Wage, May 2007	OU Degree Program
	Specialists, inc. Health†						
21-1014	Mental Health Counselors†	2,780	3,610	29.9%	138	\$19.85	Psychology; Social Work
21-1023	Mental Health & Substance Abuse Social Work†	5,200	6,750	29.8%	265	\$17.15	Psychology; Social Work
29-1123	Physical Therapists†	6,820	8,510	24.8%	251	\$34.80	Physical Therapy; Transitional Physical Therapy ⁵³
29-1127	Speech-Language Pathologists†	5,040	5,410	7.3%	134	\$35.57	Audiology ⁵⁴ ; Speech Language Pathology

RSS, recreation, sports sciences

Occupations with High Employment Prospects in Ohio, Requiring a Doctoral Degree‡ or First Professional Degree §⁵⁵

SOC Code	Occupation Title	2006 Annual Employment	2016 Projected Employment	Percent Change	Total annual openings	Average Wage, May 2007	OU Degree Program
19-1042	Medical Scientists, except Epidemiologists‡	1,560	1,780	14.1%	70	\$29.14	Osteopathic Medicine
19-3031	Clinical, Counseling and School Psychologists‡	4,600	5,020	9.1%	113	\$38.23	Psychology
29-1062	Family and General Practitioners§	6,240	6,850	9.8%	174	\$77.33	Osteopathic Medicine
29-1065	Pediatricians, General§	2,230	2,440	9.4%	61	\$70.87	Osteopathic Medicine
29-1067	Surgeons§	2,430	2,620	7.8%	63	\$96.52	Osteopathic Medicine

Commercialization of Technologies

The Office of the Vice President for Research and Creative Activity manages an annual internal award investment portfolio of more than \$500,000 to support research projects, from initiation to completion. Through the proposal review process, with more than 250 proposals received annually, the Office identifies projects with potential for

⁵³ OU now offers the Au.D., rather than M.S. degree.

⁵⁴ OU now offers the DPT, rather than MPT degree.

⁵⁵ Ohio Department of Job and Family Services, Bureau of Labor Market Information (November 2008).

intellectual property and contacts the Technology Transfer Office for follow up. In 2009, the Office instituted a new program, the Technology Gap Fund, with an annual budget of \$200,000 to provide limited but critical resources to test and refine inventions to add value and de-risk technologies. As part of the process, applicants are given feedback regarding their proposed business plan from the committee composed of university researchers, venture capital investors, and entrepreneurs.

The following commercialization indicators demonstrate further potential for economic advancement in this area:

- Intellectual Property Portfolio: 114 invention disclosures, 62 patent applications, 29 patents
- Start Up Companies: Four biotech companies – Diagnostic Hybrids, Interthyr, DiAthegeen, and Promiliad – have been created from technology developed by OU faculty
- Job Creation: 12% of Diagnostic Hybrid Inc.'s (DHI) 2008 revenues and 25 FTE were derived from their Thyroid product developed in collaboration with Len Kohn, professor emeritus, and Interthyr. DHI just received FDA clearance on a 2nd generation product; product revenues are expected to reach \$10 million by the end of 2011.
- Royalty fees: \$14.5 million, garnered from Somavert (FY05-08); based on projections, FY09 revenues should reach \$7 million (25% increase relative to FY08). A second-generation product is currently in development.
- OU Intellectual Property with Near-term Economic Impact:
 - Eye tracking system for assessment of language comprehension of stroke and brain injury patients (LC Technologies, Inc.)
 - Insulin Pump (Medtronic MiniMed Inc.)
 - Improved therapeutic (toll-like receptor blocker) for the treatment of diabetes and cancer (Interthyr)
 - Prototype for hearing aids to ameliorate tinnitus (Otothera, Inc.)
 - Diagnostics for detection of early stage type II diabetes (DiAthegeen)
 - New class of platinum anti-cancer drug with reduced toxicity
 - New class of antibiotics for drug-resistant strains (Promiliad)
 - Plant-derived glycoproteins for enhanced drug efficacy (Phyton)
 - An innovative hysterectomy surgical technique (Ethicon Endo-Surgery, Inc.)

4. FACULTY MEMBERS ASSOCIATED WITH THE CENTER

Lists of faculty, with brief descriptions of their research interests are summarized below.

Translational and Clinical Research.

OU has significant strength in experimental therapeutics and diagnostics and agbioscience. In addition to areas of expertise identified in the Battelle Report, OU is well regarded in the fields of health and clinical psychology and health communication.

Endocrine diseases (and related medical complications e.g., cardiovascular disease)

- **Darlene Berryman**, Assoc. Professor, Human & Consumer Sciences – animal models of genetic and endocrine diseases.
- **Xiao Chen**, Assoc. Professor, Biomedical Sciences – gene and protein factors involved in type 2 diabetes (T2D) and obesity (adipogenesis) for insulin resistance.
- **Karen Coschigano**, Asst. Professor, Biomedical Sciences – elucidation of genes involved in the development of or protection from kidney damage either as a result of diabetes or over-expression of growth hormone.
- **Doug Goetz**, Professor, Chemical and Biomolecular Engineering – biomedical engineering, specifically, drug delivery and the biochemistry and physics of cell adhesion.
- **Sharon Inman**, Assoc. Professor, Biomedical Sciences – Renal physiology, kidney transplantation, and diabetic neuropathy.
- **John Kopchick**, Professor, Biomedical Sciences – molecular biology of growth, obesity, insulin resistance, diabetes, and aging.
- **Michael Kushnick**, Assoc. Professor, Recreation & Sports Science – metabolic disorders, including obesity prevention and treatment.

- **Edward List**, Scientist., EBI – Growth hormone (GH)/insulin-like growth factor (IGF-1) axis, diet, obesity, diabetes and aging.
- **Ann Loucks**, Professor, Biological Sciences – exercise and nutrition, energy balance and reproductive function.
- **Tad Malinski**, Professor, Chemistry and Biochemistry – role of nitric oxide and superoxide in pathology of the cardiovascular system including diabetes, hypertension, and aging effects.
- **Kelly McCall**, Asst. Professor, Specialty Medicine – pathogenesis of autoimmune-inflammatory diseases including type 1 and type 2 diabetes and cancer; innate immunity and Toll-Like Receptors; novel biomarkers of disease; drug discovery and development
- **Felicia Nowak**, Assoc. Professor, Biomedical Sciences – pathophysiology of diabetes-related kidney damage.
- **Shigeru Okada**, Asst. Professor, Pediatrics – biomarkers of insulin resistance, progression of diabetes, activity of growth hormone.
- **Frank Schwartz**, Professor, Specialty Medicine – diagnostic marker of diabetes disease progression; clinical research on community health trends and endocrine disease management

Cancer

- **Fabian Benencia**, Asst. Professor, Biomedical Sciences – immunology; capability of antigen presenting cells to act as inducers or suppressors of immunity responses.
- **Mark Berryman**, Assoc. Professor, Biomedical Sciences – role of chloride intracellular channels in cancer.
- **Rathindra Bose**, Professor, Biomedical Sciences and Chemistry & Biochemistry – development of novel platinum anti-cancer compounds.
- **Monica Burdick**, Asst. Professor, Chemical and Biomolecular Engineering.– mediators of cell trafficking in cancer metastasis. Adhesion of tumor cells to endothelium and vascular cells under hydrodynamic shear stress.
- **Yang Li**, Assoc. Professor, Biomedical Sciences – relationship between ultraviolet (UV) radiation and skin cancer
- **Ramiro Malgor**, Asst. Professor, Biomedical Sciences – role of inflammation in the pathogenesis of chronic diseases.
- **Soichi Tanda**, Assoc. Professor, Biological Sciences – genetics, molecular and developmental biology.
- **Shiyong Wu**, Assoc. Professor Chemistry & Biochemistry – regulatory signaling pathways of translation initiation and endoplasmic reticulum (ER)-stress and identification of target genes for drug discovery and disease treatment.

Neuroscience

- **Bob Colvin**, Professor, Biological Sciences – molecular pathways of zinc influx and efflux in neurons; subcellular compartmentalization of zinc in neurons, the role of zinc homeostasis in neurodegeneration.
- **Brooke Hallowell**, Assoc. Professor, Hearing, Speech & Language Sciences – eye-tracking during language comprehension in brain-injured and post stroke patients.
- **Bill Holmes**, Assoc. Professor, Biological Sciences – development of mathematical and computational models of individual neurons of the hippocampus.
- **Scott Hooper**, Professor, Biological Sciences – animal models of rhythmic neuronal activity.
- **Daewoo Lee**, Assoc. Professor, Biological Sciences – molecular and cellular bases of neuronal communication in the central nervous system.
- **Ellengene Peterson**, Professor, Biological Sciences – vestibular neuroscience: neural control of balance and spatial orientation by the inner ear and brain.
- **Michael Rowe**, Professor, Biological Sciences – vestibular neuroscience: neural control of balance and spatial orientation by the inner ear and brain.
- **David Russ**, Asst. Professor, Physical Therapy – neuro muscular stimulation to improve muscle quality and gait.

- **James Thomas**, Assoc Professor, Physical Therapy – neuromusculoskeletal disorders, including lower back pain.
- **Li Xu**, Assoc Professor, Hearing, Speech & Language Sciences – New cochlear implant technology that will permit speakers of tonal languages to perceive tones and speakers of non-tonal language to perceive music.

Infectious diseases

- **Steve Bergmeier**, Assoc. Professor, Chemistry & Biochemistry – medicinal chemistry; drug design, drug synthesis, and drug action; development of new synthetic methods that either prepare or utilize aziridines
- **Bonita Biegalka**, Assoc. Professor, Biomedical Sciences – herpes virus, human cytomegalovirus.
- **Jack Blazyk**, Professor, Biomedical Sciences – development of a class of antimicrobial peptides, based on a linear amphipathic β -sheet motif, that possesses high antimicrobial potency combined with low mammalian cell toxicity.
- **Mario Grijalva**, Assoc. Professor, Biomedical Sciences – immunological mechanisms of pathology caused by *Trypanosoma cruzi* infection; biology and epidemiology of Chagas Disease; and the improvement of the safety of the blood supply in developing countries
- **Jennifer Hines**, Assoc. Professor, Chemistry & Biochemistry – novel RNA-targeted medicinal agents to potentially treat diseases such as HIV; multidrug resistant bacterial infections; and cancer.
- **Erin Murphy**, Asst. Professor, Biomedical Sciences – molecular mechanisms controlling the expression of virulence-associated genes in the pathogenic bacterium *Shigella dysenteriae*.

Agbioscience

- **Ahmed Faik**, Asst. Professor, Environmental and Plant Biology – mechanisms of action of enzymes that modify structure of cell wall polymers.
- **Marcia Kieliszewski**, Professor, Chemistry & Biochemistry – reengineering (hydroxyproline-rich glycoproteins) HRGPs to produce new plant gums, novel glycoprotein-based biopolymer and long acting biologically potent human cytokines and hormones expressed as HRGP chimeras.
- **Allan Showalter**, Professor, Environmental and Plant Biology – elucidating the structure, expression, and function of the superfamily of hydroxyproline-rich glycoproteins (HRGPs) found in plant cell walls.
- **Sarah Wyatt**, Assoc. Professor, Environmental and Plant Biology – plant growth and development with an emphasis on the use of molecular and genetic tools to study plant responses to environmental stimuli.

Health and Clinical Psychology

- **Steve Evans**, Professor, Psychology – design and evaluation of school-based interventions for adolescents with ADHD.
- **Christopher France**, Professor, Psychology – psychophysiology of pain and cardiovascular disorders, hypertension, interventions to prevent blood donation syncope, stress and coping.
- **Christine Gidycz**, Professor and Director of Clinical Training – design and evaluation of interventions for the prevention of sexual assault, risk factors for sexual victimization and aggression, and correlates of trauma in sexual assault survivors.
- **Bernadette D. Heckman**, Asst. Professor, Psychology – cross-cultural and multicultural issues in health, health and race-related health disparities, ethnic minority mental health.
- **Kenneth Holroyd**, Professor, Psychology – pain and headache management, assessment of the effectiveness of drug and psychological treatments for pain, innovative methods of delivery of psychological services.
- **Ben Ogles**, Professor, Psychology – evaluation of psychotherapy effectiveness, the construction of clinical outcome measures.
- **Julie Owens**, Assoc. Professor, Psychology – effectiveness and feasibility of implementing evidence-based interventions for disruptive behavior disorders in the context of school-based mental health programs, the effects of integrated, interdisciplinary care in rural communities, and self-perceptions and attributions in ADHD children.

- **Stephen Patterson**, Assoc. Professor, Psychology – cardiovascular psychophysiology, psychological stress and hematology, rural health, racial and gender differences, behavioral epidemiology.
- **Julie Suhr**, Assoc. Professor, Psychology – neuropsychology of pain and other medical conditions, assessment and management of Alzheimer's disease, detection of malingering, effects of psychological state on neuropsychological performance.

Health Communication

- **Benjamin Bates**, Asst. Professor, Communication Studies – communication health campaigns; public understanding of complex policy formation.
- **Mandi Chikombero**, Asst. Professor, Media Arts and Studies – communication and development, media for social change, media, gender, and health with an emphasis on HIV and AIDS in Africa.
- **Lynn Harter**, Steven and Barbara Schoonover Professor of Health Communication – narrative approaches to health; organizing for social change; social justice.
- **Rafael Obregon**, Assoc. Professor, Media Arts and Studies - communication for development and social change, public health communication, communication planning, monitoring and evaluation.

Health Education

- **Sharon Denham**, Professor, Nursing – culturally appropriate health education about diabetes for rural populations.
- **Leslie Moss**, Director, Kids on Campus – after-school and summer programs to improve nutrition, exercise, and academic readiness.
- **Kathleen Rose-Grippa**, Professor, Nursing - ethical issues in health care; collaboration between service and education

Community Outreach and Sponsored Education

- **Jane Hamel-Lambert**, Asst. Professor, Family Medicine – community mental health partnerships
- **Timothy Heckman**, Professor, Geriatrics – HIV/Aids in elderly patients
- **Marianne Malawista**, Coordinator, OUTA Speech-Language Pathology and Audiology – serving over 5,000 children and adults (30-minute encounters) annually
- **Chad Starkey**, Assoc. Professor, Athletic Training – serving over 2,500 students annually 14 southeastern Ohio high schools,
- **Steve Trotta**, Manager, OUTA Physical Therapy – 10,000 physical therapy visits annually in the community.

5. GRADUATE PROGRAMS ASSOCIATED WITH THE CENTER

Graduate programs are housed within the Colleges of Arts and Sciences and Health and Human Services.

Program	Degrees Offered	Enrollment (2008)	# Graduates/year (3-year average)
College of Arts & Sciences			
Biological Sciences	M.S., Ph.D.	60	13
Chemistry & Biochemistry	M.S., Ph.D.	58	10
Environmental & Plant Biology	M.S., Ph.D.	31	6
Psychology	M.S., Ph.D.	91	21
Social Work	M.S.W.	27	19
Interdisciplinary			
Environmental Studies	M.S.	36	4
Molecular & Cellular Biology	M.S., Ph.D.	28	5
College of Health & Human Services			
Health Administration	M.H.A.	9	5
Public Health	M.P.H.	14	2

Program	Degrees Offered	Enrollment (2008)	# Graduates/year (3-year average)
Health Administration/MBA	M.H.A.	3	0
Speech-Language Science	Ph.D.	4	0
Hearing Science	Ph.D.	6	0
Family Studies	M.S.	11	1
Nurse Educator	M.S.N.	3	4
Nurse Administrator	M.S.N.	1	0
Nurse Educator/Family Nurse Practitioner	M.S.N.	8	1
Physiology of Exercise	M.S.	13	4

Several of these programs were rated as excellent or very good by the *Task Force on Centers of Excellence in Graduate/Professional Education*.

- Biological Sciences (M.S.), Excellent
- Biological Sciences (Ph.D.), Very Good
- Chemistry (M.S./Ph.D.), Very Good
- Environmental and Plant Biology (M.S./Ph.D.), Excellent
- Hearing, Speech, and Language Sciences (Ph.D.), Excellent
- Hearing, Speech, and Language Sciences (M.A./Clin.-Au.D.), Very Good
- Molecular and Cellular Biology (Ph.D. MCB), Very Good
- Psychology (M.S./Ph.D. – Clinical), Excellent
- Psychology, Very Good (M.S., Ph.D. Experimental)

6. PROFESSIONAL PROGRAMS ASSOCIATED WITH THE CENTER

Professional programs are housed within the Colleges of Osteopathic Medicine and Health and Human Services.

Program	Degrees Offered	Enrollment (2008)	# Graduates per year (3-year average)
Osteopathic Medicine	D.O.	444*	104
College of Health & Human Services			
Speech Pathology	M.A.	50	17
Audiology	Au.D.	21	0
Food and Nutrition	M.S.	14	5
Family Nurse Practitioner	M.S.N.	20	5
Physical Therapy	D.P.T	99	21
Transitional Physical Therapy	D.P.T.	9	0
Athletic Training	M.S.	23	14

*24-30% minority students, 20-35% first-generation college students, and 10-15% Appalachian

Indicators of program strengths include:

- OU-COM. #1 in State of Ohio for graduating primary care physicians; # 1 in the State of Ohio for retaining physicians in Ohio; Ranked by US News and World Report as 26th in the nation in number of primary care physicians produced; # 1 in performance on Part III of the COMLEX Medical Licensing Examination and second highest in the nation for first-time passage rate on COMLEX III.
- The Centers for Osteopathic Research & Education (CORE). An integrated statewide medical education consortium formed by affiliations between OU-COM and 26 teaching hospitals in Ohio, as well as other colleges of osteopathic medicine nationwide, is the nation's 1st accredited *Osteopathic Postdoctoral*

Training Institution (OPTI) and has more than 90 postdoctoral residency programs. Affiliated members (over 2000 faculty members) span colleges of osteopathic medicine nationwide (Missouri, Arizona, Kansas, and Illinois).

- Audiology. First-time pass rate on national examination 100%; Ranked by US News and World Report as 40th in the nation.
- Speech-Language Pathology. First-time pass rates on national examination >90%; Ranked by US News and World Report as 38th in the nation.
- Physical Therapy. First-time pass rates on national examination >90%; Ranked by US News and World Report as 41st in the nation.

7. UNDERGRADUATE PROGRAMS ASSOCIATED WITH THE CENTER

Indicators of program strengths include:

- Environmental Health is 1 of only 30 nationally-accredited programs. Industrial Hygiene is 1 of only 5 undergraduate programs in the U.S.
- The Honors Tutorial College (HTC), the only degree-granting tutorial college in the nation, has programs of study in biological sciences, chemistry and biochemistry, environmental and plant biology, and hearing, speech, and language sciences, and neuroscience. In addition, faculty in psychology, dietetics, nutrition, and biomedical sciences serve as HTC tutors and thesis directors.
- In AY 2008-2009, OU undergraduate students won 15 science, math, and engineering nationally competitive awards including three Goldwater Fellowships (same number as received by Harvard, Yale, and Princeton).
- Environmental & Plant Biology is the 2nd largest undergraduate program in its field in the country.
- School of Nursing offers four degree programs – an associate degree, BSN, an on-line RN to BSN program, and MSN. All degrees are offered on the Athens campus. The Assoc. degree is also offered on three regional campuses -Zanesville, Chillicothe, Southern campus.

Program	Degrees Offered	Enrollment (2008)	# Graduates per year (3-year average)
College of Arts & Sciences			
Biological Sciences	Biological Sciences Major (B.S.) Biological Sciences—Cellular and Molecular Biology Major (B.S.) Biological Sciences—Environmental Biology (B.A.) Biological Sciences—Human Biology (B.A.) Biological Sciences—Marine, Freshwater, and Environmental Biology Major (B.S.) Biological Sciences—Microbiology Major (B.S.) Biological Sciences—Prephysical Therapy Major (B.S.) Biological Sciences—Preprofessional Program Major (B.S.) Biological Sciences—Wildlife and Conservation Biology Major (B.S.)	913	95

Program	Degrees Offered	Enrollment (2008)	# Graduates per year (3-year average)
Chemistry and Biochemistry	Chemistry Major (B.S. or B.A.) Chemistry Minor Chemistry—Biochemistry Major (B.S.) Chemistry—Pre dentistry Major (B.S. or B.A.) Chemistry—Premedicine Major (B.S. or B.A.) Chemistry—Prepharmacy Major (B.S.) Environmental Chemistry Major (B.S. or B.A.) Forensic Chemistry Major (B.S.)	383	42
Environmental & Plant Biology	Plant Biology Major (B.S. or B.A.) Plant Biology Minor Plant Biology—Applied Ecology Major (B.S.) Plant Biology—Cell Biology and Biotechnology Major (B.S.) Plant Biology—Environmental Biology Major (B.S.)	81	11
Psychology	Psychology Major (B.A.) Psychology Minor Psychology Prephysical Therapy Major (B.A.)	909	201
Social Work	Social Work Minor Social Work Major (B.A.)	221	21
College of Health & Human Services			
Hearing, Speech and Language Sciences	Hearing, Speech and Language Sciences Major (B.S.H.S.L.S.) Hearing, Speech and Language Sciences Minor	328	80
Human and Consumer Sciences	Dietetics Major (B.S.H.C.S.)	105	1
	Family Studies Major (B.S.H.C.S.)	111	25
	Nutrition with Science Major (B.S.H.C.S.)	26	0
	Basic and Applied Nutrition Minor		
Nursing	Nursing, Baccalaureate Program (B.S.N.)	397	51
Public Health Sciences and Professions	Community Health Services Major (B.S.H.)	43	4
	Environmental Health Science Major (B.S.E.H.)	42	0
		184	76
	Health Services Administration Major (B.S.H.)	31	7
		58	6
	Industrial Hygiene Major (B.S.I.H.)		
	Long-Term Health Care Administration Major (B.S.H.) Environmental Health Sciences Minor		
Recreation and Sports Sciences	Athletic Training Major (B.S.A.T.)	106	7
	Exercise Physiology Major (B.S.Sp.S.)	422	72

8. OUTSIDE COLLABORATING ENTITIES

Industry – partners in sponsored research or license agreements

Abbott Laboratories (IL)	Advanced Bionics Corporation (CA)
Arrayon Biotechnology (Switzerland)	Ave Intervision (OH)
D-Pharm Pharmaceuticals (Israel)	Dazy Aphasia Center (OH)
Diagnostic Hybrids (OH)	DiAthege, LLC (OH)
Elucida Research (MA)	Frontier Pharmaceuticals (NY)
General Motors (MI)	Hershey Corporation (PA)
Icoria, Inc. (NC)	Interthyr Corporation (OH)
Johns Hopkins (MD)	LC Technologies (VA)
MedtronicMinimed (CA)	Mid-Atlantic Technology (WV)
Neurobiotex (TX)	OrthoNeuro, Inc. (OH)
Phyton (NJ)	Promiliad Biopharma (MT)
Raven Biotechnologies (CA)	Ross Labs (OH)
Shanhua International (OH)	Stroke Comeback Center (VA)
Telesage Inc. (CA)	United Biomedical, Inc. (NY)
US Army (DC)	UVO3, Incorporated (MD)

Health-related organizations – partners collaborating to provide clinical outreach

- City and county health departments
- City and county schools
- Regional hospitals, including the CORE
- Other non-profit organizations, e.g., YMCA
- Behavioral Health Organizations, e.g., Tri-Country Mental Health; Southern Consortium; Health Recovery Services
- State Agencies, e.g., Ohio Department of Health, Ohio Department of Mental Health, Ohio Diabetes Prevention and Control Program
- Tri-County Mental Health
- Hocking County Behavioral Health
- Shawnee Mental Health Center
- Cleveland Clinic Foundation

Schools and Community partners collaborating in clinical outreach programs

- Adams County Schools
- Athens City Schools
- Gallia County Local Schools
- Hocking county Juvenile Court
- Logan-Hocking School District

Academic Partners, See Appendix III.A

9. SUPPORTING SCIENTIFIC, SCHOLARLY AND/OR CREATIVE ACTIVITIES

Supporting scientific and scholarly activities are detailed in faculty and staff biosketches (see Appendix III.B).

10. MANAGEMENT PLAN

The Center of Excellence will leverage the administrative infrastructure of a new Academic Health Center (see Section 11). As part of the development of the AHC, the deans of the College of Osteopathic Medicine and Health and Human Services have appointed a Steering Committee that will present a report on a proposed administration structure, mission, and metrics to the university president in Fall 2009.

The following administrative structure is envisioned for the Center of Excellence. A director will be selected to oversee the programmatic and fiscal activities of the Center of Excellence. Each of the foie translational and clinical research, innovations in health education, and community health services – will have a Task Group with a Chair. The Task Groups will be responsible for defining, implementing and monitoring activities within their foci. Task groups will meet as appropriate.

The Director, Task Group Chairs, Deans from each of the represented Colleges, the Provost and the Vice President for Research will form an Executive Leadership Council. The Executive Leadership Council will meet quarterly and will submit a report on expenditures and progress against metrics to the Board of Trustees and Board of Regents.

The Center of Excellence will also have an External Advisory Board composed of representatives from industry, health agencies, the community, and preferably an administrator from an established Center of Excellence in Rural Health. The first order of business for the Executive Leadership Council, in consultation with the Advisory Board, will be to establish a multi-year strategic plan, including programmatic activities and identification of resources, both personnel and financial. As part of this process, it will be important to identify and examine practices of peer and aspirational entities to establish realistic goals and milestones for the Center of Excellence. Possible entities include:

- Idaho State University <http://www.isu.edu>
- Southern Illinois University <http://siuc.edu>
- University of Alabama <http://cchs.ua.edu/rhi>
- University of North Dakota <http://www.und.nodak.edu>

11. RESOURCE MANAGEMENT AND FUNDING PLAN

The potential of the Center of Excellence is based upon significant prior institutional commitments. This has allowed OU to develop projects into integrated programs with activities yielding significant economic and community impact.

Institutional Commitment.

In 2005, OU designated a broad coalition of researchers tackling fundamental issues with translational bioscience and clinical research as a major research priority. The selection process included internal, as well as external review by experts in the field. The initiative received a commitment of \$8 million in funding for six years, with additional funding predicated on annual reviews and achievement of stated milestones and metrics.

The designation of this initiative as a priority has allowed the University to strategically allocate internal resources and funding towards biomedical and biotechnological sciences, bioengineering, and the applications of those fields. As part of the initiative, the University hired and/or provided start up for five faculty members, supplementing the usual departmental selection process, and allocated tuition stipends for more than 90 graduate students.

The University also prioritized this area for federal appropriation requests, receiving more than \$917,000 for clinical research and outreach programs, and capital projects. The Porter Addition, approximately 18,000 square feet and costing \$7 million, was a significant investment, creating state-of-the-art research and teaching spaces for the environmental and plant biology and psychology departments. In Winter 2010, the Academic Research Center (ARC), totaling more than 87,000 square feet, will open. The Office of Development and the Colleges solicited and received more than \$20 million from private and foundation donations to build the ARC with the vision of supporting interdisciplinary research at OU, leading to new technologies, diagnostics, therapeutics, and treatment paradigms. It is important to note that the University made a significant commitment to both of these construction projects in difficult financial times, reprioritizing capital funds of other major pending construction projects on the main campus.

In the future, the University will make further enhancements by the creation of an Academic Health Center (AHC). The AHC will be composed of the College of Osteopathic Medicine and a College of Health Sciences and

Professions and will have affiliated faculty representing clinical, academic and research areas of health in the other OU academic units as well. The AHC will work to coordinate the overall health care delivery within the University, align efforts with area and community health providers and serve as the nexus under which health- and bioscience-related research efforts will be coordinated. The first step in the formation of the AHC is the restructuring of the College of Health and Human Services, focusing the College on four of its existing schools (School of Nursing, School of Physical Therapy, School of Hearing, Speech, and Language Sciences, and the School of Public Health Sciences and Professions) and the addition of a new school (School of Exercise and Athletic Training), to form the College of Health Sciences and Professions.

A major benefit of the AHC is the bringing together of academic, research and clinical programs with close affinity, thereby facilitating interdisciplinary collaboration; creating efficiencies of scale especially in relation to facilities such as anatomy laboratories, specialized research equipment, and training facilities; and providing a learning environment that models the team approach to patient management currently applied in the health industry. A particular strength of this academic health center will be the ability to use the Centers for Osteopathic Research and Education (CORE) system of 26 hospitals along with those associated with the nursing program to create potential training efficiencies, offer clinician training in health-related areas other than medicine, forge new opportunities for collaboration in clinical research, and open venues for the recruitment of students. Further, the AHC will encourage the development of other allied health and health-related academic programs for which there is strong employment demand.

Resource Management

The Executive Leadership Council (ELC) will be responsible for the overall management of the Center of Excellence program, including fiscal management. The program will require capital investment to respond to the need for new assets or improvements to assets that will achieve Center of Excellence objectives. Potential investments include faculty, research and clinical fellow, graduate student, and administrative personnel hires, facilities renovations, and equipment purchases. The ELC will work with university entities as required to authorize, appropriate, and expend resources to sufficiently meet program objectives in a timely manner.

The ELC, in consultation with the university community and with agreement by the Board of Trustees and the Board of Regents, will develop a 5-year resource management and funding plan prior to the establishment of the Center of Excellence. The ELC or their designate (Director) will be responsible for reviewing proposed project expenditures to ensure they are justified, assessing proposed funding plans for feasibility, and reviewing projects for consistency with program and university priorities.

The University is currently preparing to launch a capital campaign. As part of the campaign the University has committed to fundraising for three endowed chairs for the Center of Excellence. In addition, the University has launched the 1804 Fund campaign to “enhance the quality of University programs and life” through support of faculty research, graduate studies, and undergraduate learning. Several of the translational research projects listed in Section 3 have received 1804 Funds. To date, the Fund has awarded in excess of \$14 million to more than 500 projects and programs. The campaign goals are to increase the endowment from \$5 million to \$10 million.

12. SPONSORED PROGRAM ACTIVITY ASSOCIATED WITH THE CENTER

A list of programs with the number of persons served annually, as measured by number of encounters, and a brief description are given below. The vast majority of these programs take place in community settings, with services reaching 21 of the Appalachian counties.

Program	Persons Served/ Year	Description
University Medical Associates	100,000	Medical Group Practice staffed by Ohio University faculty.
Healthy Child Care Ohio	3,450	Education and consultation on health and safety of children in out-of-home child care in 18 counties in SE Ohio.

Program	Persons Served/ Year	Description
Kids on Campus	600	High-quality out-of-school programming to provide low-income, at-risk children with the opportunity to enhance academic and life skills.
Diabetes in Action	318	Provides screening and risk reduction for persons developing diabetes; provides education and supervised exercise program for diabetic patients.
Integrating Professionals for Appalachian Children	595, plus 1365 development screenings completed	IPAC holds two federal grants addressing integration of MH services into setting where children are served, and strengthening local capacity to deliver integrated, interdisciplinary health care to children. Program is coordinated through IPAC, a university-community rural health network.
Well Child Program	46 families	Assists in obtaining health services for uninsured children in SE Ohio.
Perinatal Program	283	Perinatal education, support services and nurse case management to high risk pregnant women at the 200% and below poverty level.
Childhood Immunization Program	8,554	Free routine immunizations to children 0-18 years of age in a 21-county area of SE Ohio, regardless of client income or insurance status.
AmeriCorps/ComCorps Health Education	18,267	Community-based volunteer program that provides service and education opportunities to those entering the health, education and social service fields.
Health Screening	13,469	
Access to Healthcare	3,960	
Community Volunteers	283	
Programs for Adults	325	Offers healthy adult breast screening and cervical cancer screening program for uninsured and underinsured women 40-65. Presents information about women's health issues at schools, community agencies, senior centers, and businesses.
Healthy Adult Program	1,600	Offers free glaucoma, blood pressure, cholesterol, and glucose screenings for adults in SE Ohio to screen for early signs of disease.
Free Clinic	348	Free medical episodic care and ongoing diabetic management care for adults 18-64 without insurance and at 150% of poverty rate.
Tb Clinic	595	Follow up treatment and management for Ohio University students that have a positive Tb test.
Continuing Education	1,931	Programs provided to physicians, nurses and other health care profession.
Women's Health Month	317	Programs delivered during Women's Health Week focusing on women's health issues.
Resources for Community Education	3,802	Resources provided for community education.
Medical Student Training Clinical Community Experiences	251	Training opportunities through the Area Health Education Center (AHEC) for medical students at 159 sites overseen by 229 preceptors.
Service Learning & Touch Service Learning T.O.U.C.H.	3,817.5 hours 4,300 hours	Medical students volunteer to do a health-related or community-oriented (T.O.U.C.H.) event.

Program	Persons Served/ Year	Description
Health Careers Middle School High School College Students	1,047 142 4	In school programs to support the exploration of health careers.
American Heart Training Center	937	Training programs: CPR, basic Life Support for Health Care Provide, Advanced Cardiac Life Support and Pediatric Advanced Life Support
Youth Experiencing Success in Schools (Y.E.S.S.) Program	25	School-based program designed to increase access to evidence-based services for children and families in Southeast Ohio who struggle with inattention and disruptive behavior problems
Psychology and Social Work Clinic	264	Closely supervised “real world” training experiences for graduate students and provision of clinical care.
Athletic Training	2,500	Licensed athletic trainers in OU’s post-professional academic program serve high school athletes in 14 southeastern Ohio high schools.
OU Therapy Associates – Speech and Hearing	5,000 (visits)	Children and adults with speech, language, and hearing disorders are seen for diagnostic and therapy services in Grover Center’s Clinic.
OU Therapy Associates – Physical Therapy	10,000 (visits)	Over 10,000 visits by children and adults in the Athens and surrounding community are treated by OU’s physical therapy professionals.
OU Respite Volunteer Service	4300 (visits)	Sends trained student volunteers to offers in-home relief for caregivers in the Athens area

13. SUGGESTED METRICS THAT DEFINE EXCELLENCE FOR THE CENTER

The following metrics will be used to assess program excellence.

World Class Academic Talent (Inputs)

- Total research expenditures - Total external funding, including research and sponsored programs and sources of funding (State, Federal, other) will be tracked.
- Private investment into program (both capital, research, and any other private giving)
- Referenced publications per faculty member - Lists of referenced publications, rather than citations, will be used as the program spans multiple fields where tracking citations are complicated by the existence of multiple sources and standards for reporting citations.

Connection to the industry’s local economy (Value added)

- Licenses and options executed (number of deals)
- Invention disclosures – Patent applications will also be tracked.
- Startup companies resulting from Centers of Excellence – In addition, value added to existing small companies (e.g., DHI), including increased revenues or workforce, will be tracked.

Economic Impact (Outputs)

- Graduates placed in their field in the state--will be tracked for medical students, nursing students, speech-language pathologists, audiologists, physical therapists, and athletic trainers specifically, as a major objective of both programs is workforce development for the local underserved region.
- License income
- Number and types of patients served – annually via Community Health Programs, OU-COM's Area Health Education Centers--AHEC, University Medical Associates, OU Therapy Associates (speech-language pathology, audiology, physical therapy) and Athletic Training.

