Goal 2: Build the Mizzou Advantage, a set of focused, interdisciplinary initiatives that capitalize on existing strengths and bring new international distinction to MU

Networks of faculty, staff, students and external partners build on targeted areas of existing strength to create major initiatives that tackle some of the most exciting challenges of our era by bringing together researchers from many disciplines. These networks engage in a range of interdisciplinary activities, including innovative interdisciplinary teaching, multi-division research projects, conferences and symposia, clinical trials and hands-on collaborations with external partners, to name a few. Each initiative has a significant international component, bridging research and teaching on the MU campus to partners around the globe. Fluid and adaptive, the networks will likely change composition and focus through the years to adjust to changes in the environment. The initiatives (in alphabetical order) are:

Food for the Future

Birthday cakes and matzoh balls, the economic power of U.S. agriculture, Cézanne’s fruits, the importance of nutrition to health, humanitarian efforts to end hunger around the world — these all attest to the central role that food plays in every aspect of human life and our urgent need to better understand its production, distribution, consumption, and cultural meanings in our rapidly changing times. Drawing upon the resources on campus and around the state, nation and the world, the Food for the Future initiative enhances existing strengths on campus — for example, in the College of Agriculture, Food and Natural Resources, Food for the 21st century, MU Extension and programs in medicine, nursing, literary studies, history and the health sciences. It will draw faculty from other disciplines eager to work collaboratively on this theme, central to human existence.

Media of the Future
This initiative focuses on how new media technologies and paradigms continually change the world around us and how we — as citizens and professionals — respond. Building upon strengths in journalism, the Reynolds Journalism Institute, the College of Arts and Science, the Center for the Digital Globe, engineering, and information sciences and learning technologies and reaching out to researchers in virtually every discipline, Media for the Future will stimulate interdisciplinary teaching, research, outreach and economic development efforts that will have impact throughout the globe.

One Health, One Medicine: The Convergence of Human and Animal Health

MU’s vigorous interdisciplinary tradition and the presence of internationally recognized strengths in medicine, veterinary medicine and animal science make this initiative a natural one for world leadership by MU. It will involve faculty who work in such areas as health communication, health policy, ethics, environmental sciences and national security. Themes could include public health, clinical/translational research, comparative models for human and animal medicine, zoonotic disease, complex data analysis, pandemics and bioterrorism prevention.

Sustainable Energy

MU is uniquely poised to be a national and international leader in the efforts to develop and bring to market reasonably priced and environmentally friendly energy. MU boasts the nation’s largest university nuclear research reactor and has strong ties to the nation’s agribusiness industry. It also has one of the world’s strongest plant science programs, with a strong focus on biofuels, as well as wide and deep research strengths in engineering and basic and applied sciences. Equally important, this initiative draws upon the resources of a rich interdisciplinary community — of economists, ethicists, designers and architects, sociologists and public policy experts, among others — able to explore the complex ways that existing and emerging technologies, as well as energy policies, affect the health of our state, nation and world.
Educational Objectives & Actions:

2.1 Leverage the interdisciplinary networks of the initiatives to create a climate in which students, faculty, staff, alumni and administrators engage across demographic, social and interpersonal differences through curricular and co-curricular activities that prepare students for lives and careers in a multicultural global community

Action Needed:
» Create a database that will track interdisciplinary networks within each initiative and across initiatives.
  Responsible: Informatics Institute and members of “Architecture of Collaboration” (Mizzou Advantage-funded project), Mizzou Advantage Program Director
» Provide matching funds to hire new faculty who will work across disciplines to strengthen and expand networks.
  Responsible: Provost

Recent Actions Taken:
» Maintain database of 2,400 individuals involved in Mizzou Advantage interdisciplinary networks, projects and events.
» Hired three faculty members in 2012-2013, including a member of the National Academy of Sciences. An additional hire will start in Spring 2014, and five hires have been approved for AY14.
» 17 Mizzou Advantage Faculty Development Awards have been granted since the program began in 2012. Providing up to $2,000 per grant, Faculty Development funds enable MU staff to enhance their expertise in one of the four Mizzou Advantage areas.

2.2 Establish undergraduate and graduate certificate programs with interdisciplinary courses centered on the theme of the initiative

Action Needed:
» Facilitate connections among academic units and support the development of interdisciplinary certificate programs.
  Responsible: Mizzou Advantage Facilitators and Education Coordinator

Recent Actions Taken:
» The goal of the Interdisciplinary Initiative (I2) is to facilitate an ongoing, campus-wide exchange about interdisciplinary teaching and research at the undergraduate level. I2 is open to all faculty members on campus.
» Mizzou Adventures in Education and graduate student teams provided a unique interdisciplinary outreach experience for K-6 children and their families.
2.3 Expand and diversify learning opportunities for students inside and outside the classroom

Action Needed:
» Create problem-based learning courses and blended classroom/on-line hybrid classes.
» Develop initiative-related extra-curricular experiences such as residential learning communities, corporate and non-profit internships and service learning projects.
» Offer initiative-related cross-cultural experiences for students and faculty, including study abroad opportunities.
» Use new technologies to bring scholars and other experts to campus, including virtually, from around the world.
» Create postdoctoral fellowship program to provide training and support the development and teaching of new interdisciplinary courses related to Mizzou Advantage.
» Utilize postdoctoral fellows to develop and teach interdisciplinary courses related to Mizzou Advantage areas.
» Increase employability of MU recent doctorates.

Responsible: Mizzou Advantage Facilitators and Education Coordinator, Graduate School/Office of Postdoctoral Education

Recent Actions Taken:
» 52 Mizzou Advantage Student Travel Awards have been awarded since 2012. Student travel awards support both undergraduate and graduate students attending conferences with faculty members.
» Mizzou Adventures in Education and graduate student teams provided a unique interdisciplinary outreach experience for K-6 children and their families.

Research Objectives & Actions:

2.4 Increase stature of MU as an international leader in interdisciplinary areas, research and creative activities

Action Needed:
» Produce a significant body of interdisciplinary research, including books, refereed articles and convention papers, creative products/activities, Web content and articles for trade and general publications.
» Engage groups or individuals at other universities in collaborative research, including experiments in the use of innovative software to facilitate virtual teams of researchers working from around the world.
» Collaborate with leaders in the field, through “super summits,” conferences featuring both established and emerging leaders; one-on-one recruitments of National Academy members and creative on-going appointments to the MU faculty (summer, one-week, etc.).

Responsible: Provost, Office of Institutional Research, Deans, Mizzou Advantage Facilitators

Recent Actions Taken:
» Faculty in the Law School spoke or taught in conferences and workshops held in China, Japan, Germany, Hong Kong, Luxemburg, Netherlands, and South Africa.
» The Law School continues to offer an extremely successful study abroad program for law students at the University of Western Cape in Cape Town, South Africa.

» Drs. Marilyn Coleman and Lawrence Ganong, professors of Human Development and Family Studies, serve on the Board of Directors of the National Stepfamily Resource Center.

» The School of Medicine and MU-iCATS opened a new state-of-the-art Clinical Research Center to facilitate clinical research opportunities for investigators on the MU campus, including the capability of conducting Phase I clinical trials.

» Architectural Studies faculty conducted a creativity workshop between Hallmark Incorporated and 7 Mizzou students of various disciplines. The purpose was to examine how each discipline might have a unique perspective on an interdisciplinary creative process.

» Architectural Studies is co-leader and participates in a national web-based program on Home Energy through the eXtension.org program. This grant funded program provides collaborative, researched-based, energy information for consumers on topics such as existing homes, new construction, and alternative energy systems.

» An official Inter-university agreement between Human Development and Family Studies (HDFS) at the University of Missouri and the University of Valencia (Valencia, Spain).

» HDFS faculty members partnered with faculty members in Psychiatry and Child Health at MU on a project in which they will train mothers in Pakistan to teach other mothers how to help their children learn basic, but important, skills and knowledge.

» Textile and Apparel Management (TAM) faculty member was invited to deliver a keynote speech at the International Conference of Design between Innovation & Sustainability organized by Helwan University, Cairo, Egypt.

» TAM faculty members and graduate students had research and teaching collaborations with an apparel manufacturer in El Salvador to improve overall product development capacity and capabilities.

» Fully executed MOU’s were approved last year with three universities in China. They will send students to complete their Master’s degrees in Personal Financial Planning at MU.

» School of Social Work faculty members serve on key committees and organizations, especially in the areas of gerontology and military social work. These include, among others, the National Institutes of Health, Council on Social Work Education, National Association of Social Workers.

» Colleen Galambos, Social Work faculty member, has been awarded Fellow status with the Gerontological Society of America (GSA), the nation’s oldest and largest interdisciplinary organization devoted to research, education, and practice in the field of aging.

» Marjorie Sable, Social Work Director, is a Governing Councilor of the American Public Health Association, the oldest and most diverse interdisciplinary organization of public health professionals in the world.

» Dr. Casandra Harper from the Department of Educational Leadership and Policy Analysis, is a National Academy of Education/Spencer Postdoctoral Fellow for 2012-14.

» Drs. Wendy Reinke and Keith Herman from the Department of Education, School and Counseling Psychology were awarded funding from the Institute of Educational Sciences for two projects focusing on behavior management in schools. The total funding for the two grants is over 3 million dollars.

» Dr. Chris Riley-Tillman's and his collaborator’s behavior assessment method called Direct Behavior Rating (DBR) was vetted and endorsed by the National Center for Intensive Interventions. At this time DBR is the only behavior assessment tool supported by the center for tracking educational behavior intervention.

» The MU Center for School-wide Positive Behavior Supports was nationally recognized by the U.S. Department of Education in recent senate hearing testimony on stopping the “school to prison pipeline.”
Faculty in the Department of Special Education just completed the first national randomized control trial on the impact of a multi-component intervention on academic and social success of students with behavioral disabilities.

The Center for Social and Behavioral Supports is collaborating with the National Center on Secondary Education for Students with Autism (CSESA) to develop the first comprehensive academic and social curriculum for high school students with autism.

Faculty in the Department of Special Education was awarded an NIH grant in partnership with The Thompson Center for Autism and Developmental Disabilities to evaluate the Autism Intervention Measure (AIM).

Faculty in the Department of Special Education have collaborated with faculty in the School of Information Sciences and Learning Technologies to develop the first comprehensive social competence curriculum delivered in a virtual learning environment (3D-VLE) for school use.

Learning, Teaching and Curriculum (LTC) and Special Education Faculty were awarded an NSF grant to support the QuEST: Quality Early Science Teaching Project. This collaborative effort headed by Debi Hanuscin, faculty in LTC includes researchers from the Departments of Educational, School, and Counseling Psychology and the Economic, Policy, and Research Center.

Mizzou Advantage new hire, Professor Christine Elsik, has a joint appointment in the animal and plant sciences divisions and specializes in computational biology and bioinformatics. She works specifically in genome sequencing and annotation.

Two CAFNR faculty members were elected to the rank of Fellow in the prestigious American Association for the Advancement of Science.

Jerry Taylor, University of Missouri Curators’ Distinguished Professor of Animal Sciences and Wurdack Chair of Animal Genomics, received the Rockefeller Prentice Memorial Award in Animal Breeding and Genetics from the American Society of Animal Science.

Perry Gustafson received the Outstanding Crop Scientist Award at the 6th International Crop Science Congress in Bento Goncalves, Brazil.

The Board for International Food and Agricultural Development (BIFAD) was hosted at MU.

Four programs supported by the USDA Cochran Fellowship Program included delegates from Turkey, Algeria, South Africa, and Senegal.

### 2.5 Stimulate graduate and undergraduate collaborative research with faculty

**Action Needed:**

- Establish assistantships, internships, participation in on-campus conferences and symposia and support for research-related travel. Develop interdisciplinary research teams at the undergraduate and graduate level.

  **Responsible:** Mizzou Advantage Facilitators and Education Coordinator

**Recent Actions Taken:**

- 52 Mizzou Advantage Student Travel Awards have been awarded since the development of this program in the Fall of 2012. Student travel awards support both undergraduate and graduate students attending conferences with faculty members.
2.6 Increase the number of large-scale proposal submissions in Mizzou Advantage areas

Action Needed:
» Provide faculty with training and administrative support to develop cooperative grant proposals.
» Increase post-award grant management infrastructure.
» Increase support for the grantwriter network.
» Develop strategies to support innovative research and collaborations with the public and private sectors.

*Responsible: Provost, Mizzou Advantage Facilitators*

Recent Actions Taken:
» The biomass proposal US-India Consortium for Development of Sustainable Advanced Lignocellulosic Biofuel Systems was selected for funding by the Department of Energy. The total funding to MU is $5.4 million. MU is the lead institution on feedstock issues.
» Mizzou Advantage awarded twenty-six seed funding grants totaling almost $600,000 to raise promising projects to the next level.
» A new Interdisciplinary Intercampus Research Program was created to increase research activity that could lead to the advancement of technologies and commercialization.
» The MU Office of Sponsored Programs Administration offered a Certificate Series for Specialized Grants Training.
» The Fourth Annual Federal Research Update Webinar hosted by the University of Missouri, the National Association of College and University Business Officers, and the Florida High-Tech Corridor Council attracted 1500 registrants.

Outreach Objectives & Actions:

2.7 Use the broad and deep resources of Mizzou Advantage; offer educational opportunities on Mizzou Advantage Initiatives to enrich the quality of lives of Missourians

Action Needed:
» Work with K-12 and community college teachers in Missouri to develop pedagogical materials and approaches related to the initiatives.
» Offer initiative-related summer workshops for alumni and high school students.
» Offer educational opportunities on initiative themes throughout Missouri in collaboration with other universities, community colleges, service clubs, community groups and schools.

*Responsible: Vice Provost and Director of Cooperative Extension*

Recent Actions Taken:
» Lexington, MO will host the first Community Art Pilot Project (CAPP) mini-residency with instructor and students. CAPP will begin work on the music/audio components of the Civil War/architectural tour.
» Food Insecurity: Assessing Disparities, Consequences, and Policies, was held on the MU campus. Researchers from institutions across the country met with policymakers and advocates.
Howell County will host the “Working on the Youth Biz Program” for high school students in a seven-county area, bringing Extreme Entrepreneur Tour and offering summer business workshops.

2013 Annual State 4-H Congress brings 272 Missouri 4-H’ers ages 14 to 19 to the Mizzou campus to connect faculty for educational opportunities, elect youth leadership and experience campus living.

Summers@Mizzou brings 88 youth ages 12 to 18 to the Mizzou campus to connect with faculty for educational opportunities and experience campus living.

Youth Futures: College Within Reach brings 92 first-generation high school youth to the Mizzou and Lincoln University campuses to learn about college enrollment procedures, financial aid, engage in educational opportunities focused on succeeding in college and experience campus living.

Visual imaging: A language to communicate science, presented in the summer 2013 Science Communication workshop hosted by the interdisciplinary Science Communications Network funded by Mizzou Advantage.

Youth Development Academy trained 52 professionals reaching a conservative estimate of 14,400 youth in 2012-13.

Missouri Afterschool Network has provided training and technical assistance to 76 School Age Community (SAC) and 21st Century Community Learning Center (21st CCLC) grantees at 208 afterschool programs.

Missouri AfterSchool Network’s Project LIFTOFF has provided training to 210 professionals improving the quality of STEM education for approximately 2725 youth.

4-H Center for Youth Development reached over 8,500 youth through on-campus education programs.

Aerospace Camp brings 120 middle school youth to the Missouri S&T campus to explore aeronautics and space flight in 2013.

4-H LIFE (Living Interactive Family Education) serves families of 300 offenders reaching 400 of their children throughout Missouri Correctional facilities offering mentoring, parenting skill classes and youth education and leadership experiences. Missouri 4-H Homegrown Leaders Project in Barry, Dade, Dallas, Polk, Oregon, Dunklin, and Ripley counties involves 93 youth, 71 adults and 35 community partnerships to address social, cultural, economic and environmental concerns.

The Missouri Geographic Alliance secured a statewide license for the ESRI Geographic Information Systems (GIS) software for all K-12 youth education (public, private, homeschool, youth serving organizations). In addition to each of the schools in the 525 school districts of Missouri, the statewide license is available for the more than 580 private schools, as well as the 53 charter schools, 30 magnet schools and the estimated 40,000+ homeschoolers in Missouri.

Economic Development Objectives & Actions:

2.8 Graduate leaders and a world-class workforce in initiative-related fields

Action Needed:

- Network with state, regional and national business, government and non-profit leaders and the state’s community colleges.

  Responsible: Office of Technology Management and Industry Relations

Recent Actions Taken:

- Increased student inventor and faculty contact with investors through annual Missouri Technology Expo.
» Template agreements developed for engaging companies to support undergraduate capstone research projects that provide real world research experience.
» Provide Graduate Research Assistantships for programs that foster student technology transfer experiences.
» Support and mentored the student-focused organization CLIMB (Collaboration, Leadership, Innovation for Missouri Business), a program designed to promote and facilitate the exchange of entrepreneurial ideas at Mizzou. CLIMB merges people with ideas and people with experience and resources to realize those ideas.
» Archer Daniels Midland Company (ADM) presented a gift of $1 million to support a dedicated laboratory space designed specifically for student experiential learning.
» As part of online program initiative, MU moved 16 degree and certificate options to online formats, increasing access to affordable, accredited higher education.
» Per Governor’s initiative on Innovation Campus Grant Program and MU partnership with community colleges, MU will prepare 125 associate degree (RN’s) from St. Charles County who will ultimately enroll in and graduate from the on-line BSN in Nursing program from MU.

2.9 Increase numbers of commercial applications, start-ups and patents

Action Needed:
» Invent, test and license or patent significant new technologies, leading to start-up companies or new business models.
» Collaborate with leaders in the field through “super summits” of conferences featuring established and emerging leaders, one-on-one recruitments of National Academy members and creative ongoing appointments to the MU faculty (summer, one-week, etc.).

Responsible: Office of Technology Management and Industry Relations

Recent Actions Taken:
» In FY2013, executed and furthered MU intellectual property with 82 Invention Disclosures; 96 US patent applications; 22 issued patents; 28 licenses and options.
» 7 Start-up businesses in FY2013 licensed technology from MU.
  » NEAT Healthcare LLC
  » DiNeu Technologies
  » ImpeDx Diagnostics LLC
  » Medsocket LLC
  » CardiOptimus LLC
  » Nanopore Diagnostics LLC
  » Adsorbed Natural Gas Products

» In FY2013, MU held 202 active Licenses and Options with 72 licenses generating revenue.

2.10 Enhance the economic development activities in initiative-related themes

Action Needed:
» Increase the number of jobs created and/or retained through MU Extension programs.
» Foster relationships with regional and statewide economic development organizations.
» Invite state business leaders to participate in initiative-related courses, workshops and meetings with students.

**Responsible: Vice Provost for Economic Development, Office of Constituent Relations**

**Recent Actions Taken:**

» In cooperation with the MU Office of Research and REDI, negotiated the opening of the “Beyond Meat” manufacturing plant, bringing 60 new jobs to Columbia, Missouri.

» MU actively engages in the Kansas City Area Development Council (KCADC) Higher Education Task Force in Kansas City to support Kansas City Access U project.

» An Economic Development study that measures MU contributions to quality of life through the Department of Athletics was completed in FY 2012. The total direct economic impact was calculated to be over $147 million.

» MU engaged with 16 local, regional, and statewide Economic Development agencies in Fiscal Year 2013.

» MU continues to work with the National Association of Public and Land Grant Universities to develop a set of metrics that would be used nationally to measure campus economic development impact. As part of this initiative, MU:
  » Conducted a survey of internal and external stakeholders to learn the measures that are most important to them
  » Attended a national meeting on economic development measurements, learning to develop the right impact measures that best fit our campus
  » Participated in a pilot award program, which provides an opportunity for shared information between institutions, what works well, what’s more difficult, and what is the best impact to capture to tell the best story of our economic development accomplishments.

» MU Extension Business Research and Information Development Group hosted an economic gardening conference in June. Two tracks offered programs for nurturing entrepreneurs and programs for economic developers.

» Jim Gann, of the Small Business and Technology Development Center, received a Community Connected Campus award of Excellence at the 2012 University Economic Development Association (UEDA) Summit for his work on the “Kemper Military School Redevelopment Project” in Boonville, Missouri.