

Missouri State University
Future’s Research Program Review and Recommendations:
Executive Summary
 October 2009

Background and Purpose

The Missouri State University Future’s program was established in the spring of 2006 following an extensive study and recommendations made by a 17-member Future’s Task Force appointed by President Nietzel. The foundation of the Future’s Program was the designation of specific areas of contemporary scholarship where strategic investments and concentration of effort would be made with the long-term goal of strengthening and developing research areas with a high potential for excellence. The intent included the promotion of interdisciplinary innovation, strengthening research and associated degree programs, and to augment efficiencies in part by increasing capability to garner external funding.

Eleven Future’s research emphasis areas were adopted in the spring of 2006 (Table 1A). MSU has had two rounds of Future’s proposal submissions and subsequent funding of proposals (2006 and 2007). Twenty-five research proposals were funded with \$2.17 million in awards distributed. Funding went to research capacity-building as well as specific research endeavors. The duration of projects ranged from one to three years, and most of them are still in process.

Table 1. Future’s research emphasis areas adopted from the Future’s Task Force report (column A) and revisions suggested following review of the program (column B).

A. Future’s Research Emphasis Areas as Designated in 2006	B. Future’s Research Emphasis Areas as Proposed in Fall 2009
American History and Cultures	Biotechnology
Biotechnology	Environment and Water Resources
Entrepreneurship	Materials Science
Environment and Water Resources	
Global Perspectives with Emphasis on Asia	Global Perspectives with Emphasis on Asia
Health Promotion	Health and Human Development
Materials Science	Technology and Emerging Art Forms
Performing and Creative Arts	
Research on Human Development	
Research on Learning, Teaching, and Intervention	
Technology and Emerging Art Forms	

Program Evaluation

The concept of periodic evaluation of the Future's program and making needed adjustments was envisioned and stated by the original Future's Task Force report. Although only in the third year of the program, the outcomes of the Future's program show good success in its major goals. A brief snapshot lists several of the key elements that show outcomes:

- Research infrastructure has been greatly improved through acquisition of major equipment, including: Real-time PCR Instrument; X-Ray Diffractometer Systems; Dizziness/Balance equipment; DNA Synthesizer; sophisticated GPS capability; Plant Growth Chambers; and a Solid-State Nuclear Resonance Instrument.
- Focused hiring of faculty with specific expertise using "bridge-funding" for first year(s) through a Future's award: 1 SAC (Methamphetamine issues); 1 AGR (water quality); and 1 CHM (Biotechnology).
- "Centers" and Enhanced program emphasis occurred in two areas—Ozarks Culture; and Latin American/Caribbean/Hispanic Studies.
- Stimulation of external grants has been admirable. Of the 76 named faculty associated with Future's awards, 49 (64%) had applied for external funding as of July 1, 2009 and 31 (63%) of these received awards. Those awards exceed \$6 million.
- Interdisciplinary research teams have been established with faculty coming from more than one department or college. These have positioned us for more competitive research and external funding, as well as enhancing the capability for solving problems and developing applications.
- Research in the Future's areas is resulting in recognition of MSU through published outcome. Taking one of the strong examples, the Future's project titled *X-Ray Characterization and Analysis Facility* which funded instrumentation has resulted in 30 journal articles, 9 theses, and 20 presentations associated with research in this facility.

While the data show the overall outcomes of the Future's research emphasis areas are very positive, there is unevenness in the degree of success and productivity across the emphasis areas.

Recommendation

In order to sharpen focus and increase efficiency of resource allocation, it is recommended that the number of Future's emphasis areas should be reduced. The proposed revision is a Future's Program focused on six research areas, as listed in Table 1B. Five of the six are retained from the original list, and the Health and Human Development area is the result of combining two prior themes.

Rational for the Retained Six Research Targets

The Future's areas recommended for continuation are listed with highest priority as the first three in Table 1B. These three areas—Biotechnology, Environment and Water Resources, Materials Science—have multiple evidences of demonstrated success. The second three listed in Table 1B have shown more modest success, but they also are recommended based on their growth potential, community need, fit with the university mission, prospects for external support, and the potential synergy these research areas offer with respect to other aspects of the university.

Areas of Highest Priority

Biotechnology; Environment & Water Resources; and Materials Science. These three areas have demonstrated success in research productivity as a common outcome, and they have an interactive synergy in certain components of the research. Selected investment in these areas has resulted in advancement of the University's position at the national/international level, with an influx of additional resources as a consequence. Future's funding has augmented the work in the Jordan Valley Innovation Center (JVIC), stimulated formation of the Center for Biomedical and Life Sciences (CBLS), and enhanced the capability and productivity of the Ozarks Environmental and Water Resources (OWRI). Collectively, these Centers have brought in over \$24 million in external funding in the three years since the Future's program was established (JVIC \$20.3m; CBLS, \$2.8m; OWRI \$1.1m). The pertinent grants in these research areas that have come from the work of academic departments add significantly to this total, including two recent major equipment grants. Perhaps of even greater long-term importance is the evidence that we have significant coalitions of faculty working on a variety of applied and basic research problems in these areas.

Other than grant funding, evidences show that these three research areas have emerged as highlights for the University. Specifically:

- Faculty working in these areas have been leaders in the publication of research findings.
- Each of these interdisciplinary areas has developed working groups of several faculty that contribute to the overall theme area.
- Students are regularly being mentored and trained in the research process, as evidenced by their thesis work and undergraduate research projects.
- These three Future's areas have built additional, productive infrastructure over the past three years.
- Future prospects for external funding continue to be position in these fields.
- Although separate as theme areas, there is a synergy across the three areas in that (a) some common instrumentation is utilized; (b) research questions at the intersection of the disciplines are being addressed; and (c) new directions in interdisciplinary work are emerging.

Areas of Secondary Priority

Global Perspectives with an Emphasis on Asia. Productive research has emerged in this area from several Future's projects, including those titled (a) *US-China-Taiwan Studies*; (b) *Asian Arts and Letters Program*; and (c) *Creating a Center for Latin American, Caribbean, and Hispanic Studies*. The first of these projects has resulted in Missouri State hosting an international conference each of the last several years, and this has brought strong recognition to MSU, as well as published works. The other two projects have aided students as well as faculty in research. As an outcome of the *Asian Arts and Letters Program*, several music faculty have published and /or done composition work related to Asian culture and Chinese instruments.

However, the strongest reason for retaining this area as a focus is that it has a synergy with MSU's overall thrust of internationalization of our education and research. Retaining this research emphasis area is supported by several other outcomes.

- Many individual faculty have developed research collaborations with international colleagues. Examples range from work in entrepreneurship to projects in viticulture.
- Involvement of faculty with the China campus provides a research base in that country.
- MSU has agreements with a number of international partner universities that include commitments to enhance cooperative research.
- External funding of several types is available to those willing to pursue grant funding.
- Stimulation of the Study Away Programs for students should rightly include research opportunities.

Research on Health and Human Development. In the Future's Task Force original report there were two separate themes listed—Research on Human Development and Health Promotion—which were recognized as closely related. The deans provided input suggesting combining the two, since both areas had a strong relationship to health and it not productive to have any tension or semantic argument over the differences. Research on Health and Human Development has not matured at MSU, yet efforts focused on this general theme have shown that we can, and do, make research contributions to the area. Further, the combined area of Health and Human Development was strengthened from the early rounds of Future's funding. The proposal *Clinical Assessment and Treatment of Individuals with Pervasive Developmental Disabilities, Challenging Behaviors, and Sensory Impairments* drew together an interdisciplinary team from two colleges and multiple departments. The work particularly focused on educational interventions in dealing with autism -- which is an increasing challenge to families, schools, and society. The outcome of this research project was admirable for the limited investment made. Statewide connections were made and avenues for cooperative research established. A second example is the project *Development of the MSU Dizziness and Balance Program*. Future's funding provided a diagnostic system for physical therapy which has been a strong stimulus for not only research in this department, but also for cooperative work with audiology faculty.

Salient arguments to retain a combined research area of Health and Human Development are:

- Separately, the areas of Health and Human Development have a natural overlap and synergy. Combining these two areas into a united research emphasis will promote interdisciplinary work by drawing together a cadre of faculty from two colleges and multiple academic departments that have compatible research interests and capabilities.
- Health and Human Development research is vital to our efforts to give meaningful involvement to community engagement. The regional and national needs are overwhelming, and research is needed to foster solutions. (e.g., dealing with the needs resulting from the increased incidence of autism)
- Research projects relating to this theme are well-positioned to take advantage of external funding. There are federal and state agencies, as well as private foundations, that seek to fund research and applications in this area.

Technology and Emerging Art Forms. Retention of this Future's research emphasis area is recommended primarily because of its potential for supporting and "growing" some major goals of the university. We currently have ongoing faculty research that fits under the umbrella of Technology and Emerging Art Forms, particularly in the Department of Art and Design. There are also joint research ventures that have occurred between Art and Design faculty and the faculty in Computer Science. However, space has always been a major limitation to the creativity.

The facilities within Brick City "downtown" have more space that can be used for creative work, and the door is open to more research opportunities. IDEA Commons has been put forth as a vision the commitment to blend multidisciplinary university programs and bring together Innovation, Design, Entrepreneurship and the Arts (IDEA). In doing so it is envisioned that this coalesce of talent will promote the community's economic success. The goals for IDEA Commons include expanding opportunities for business development and commercializing research where expertise exists and synergy can be exploited. Hence IDEA Commons strongly implies that we must have continued active, innovative research, and some of that research will interface with emerging art forms. The Electronic Arts program is being considered for relocation to the IDEA Commons area. Further, discussion of a master's degree (MFA) in Art and Design has re-emerged.

The case for retaining the Future's theme of Technology and Emerging Art Forms is based on what MSU proclaims in its goals, rather than an extensive track record of undisputed excellence. Eventually this research area should be more sharply focused and it is quite likely that aspects of performing arts will be integrated. Likewise, at the very heart of developing the IDEA Commons concept there is the consideration of entrepreneurship. Therefore, since Entrepreneurship was one of the original Future's themes, research that continues at MSU on entrepreneurship should be supportive of Technology and Emerging Art Forms.