Research Strategic Plan
Indiana University – Purdue University Indianapolis
August 2014

Vision

To be the best urban research university by conducting world-class research, scholarship, and creative activities that develop knowledge and contribute to the health, economic growth and social advancement of the state of Indiana, the nation, and humanity as a whole.

Executive Summary

The IUPUI Research Strategic Plan is based on the initiatives presented in the "Innovation and Discovery through Research and Scholarly Activity" portion of the 2013 IUPUI Campus Strategic Plan. A Steering Committee was tasked by the Vice Chancellor for Research to develop an updated and more detailed IUPUI Research Strategic Plan as part of the IUPUI Campus Plan, and to coordinate this plan with the IU School of Medicine's Transforming Research Initiatives as well as the IU Vice President for Research's university-wide strategy.

The goal for this strategic plan is to build on the unique strengths of the IUPUI campus and its academic units to promote research and creative activity that will have a positive impact locally, nationally, and globally on the health and well-being of individuals, families, and the society. The plan presents an integrated approach that uses outreach initiatives designed to enhance IUPUI's homegrown and unique strengths in applied research and community engagement. In all cases, these actions seek to enhance innovative, effective, and rewarding research and creative activities among IUPUI faculty and students by building on existing strengths and by addressing known weaknesses and inefficiencies. Some elements of these actions reflect national trends and "best practices" in research while others adhere to those IUPUI-specific practices that are responsible for our reputation as an inclusive and forward-thinking urban campus in disciplines ranging from the health and life sciences and STEM, to the social sciences, arts, and humanities.

The Plan is centered around the establishment of Grand Challenge Initiatives and emphasizes greater cross-disciplinary research and scholarly programs that incorporate undergraduate and graduate student learning. It proposes that the University focus its energies and its financial resources into areas that can have a significant impact. This will require greater organizational efficiencies and better coordination and collaboration among Schools. The Plan recognizes that traditional approaches to research and scholarly activity are changing, and will require alterations to the manner in which scholarly accomplishment is evaluated and rewarded. To this end, the Plan presents the following five Strategic Initiatives.

(1) Launch "Grand Challenge Initiatives"

"Grand Challenge Initiatives" are long-term "Big and Bold" research programs that address critical national and international quality of life issues by establishing cross-disciplinary teams of faculty and students who collaborate with the community at large, industry and government agencies.

- Goal 1.1: Develop an Urban Health and Wellbeing (UHW) Grand Challenge within the next 3-5 years.
- Goal 1.2: Improve and expand *cross-sector and translational* research activities and initiatives with industry, government, nonprofit and other community partners to address important local, national, and global needs.

(2) Expand cross-disciplinary faculty research at IUPUI

IUPUI is known for the cutting-edge research of its faculty, research scientists, professional staff and students, and for the ability of its researchers and scholars to translate research into practical applications for the advancement of society. The academic diversity of the campus creates a rich environment that promotes inter- and multi-disciplinary discoveries and innovations. Federal funding agencies have been placing an increased emphasis on large-scale, team-based research initiatives to address complex and multifaceted problems that require cross-disciplinary collaboration.

- Goal 2.1: Advocate for promotion and tenure guidelines that align faculty rewards with campus goals.
- Goal 2.2: Provide guidance to schools to conduct coordinated recruitment
- Goal 2.3: Explore new strategies and incentives to support research/scholarly productivity among all faculty.

(3) Expand and integrate research experiences for undergraduates across all disciplines through the Grand Challenge Initiatives

IUPUI should establish opportunities for students to engage in, learn from, and contribute to the Grand Challenge initiatives. In doing so, IUPUI would be supporting proven "high impact" practices known to enhance engagement, student success and persistence. Special attention should be paid to ensuring that these experiences are available to students in all disciplines, and to students from traditionally underrepresented or marginalized groups. The goal by 2020 is to provide all IUPUI undergraduates with at least one experience relating to a Grand Challenge Initiative. These opportunities would be tiered from in-class research projects, to team-based mentored "field" projects, and ultimately to internship or capstone experiences.

(4) Develop nationally recognized graduate programs in critical areas that cross disciplinary boundaries and expand campus capacity for graduate education

The Grand Challenge Initiatives are highly cross-disciplinary, and graduate programs at IUPUI should reflect this cross-disciplinarity. More formal cross-disciplinary Ph.D. programs will be needed to establish curricula and facilitate the cross-training of students. Greater emphasis should also be placed on developing graduate partnerships and internships between university and industry laboratories. Different models for industry/university partnerships that support graduate training for IUPUI students should be explored.

(5) Encourage wider access to findings and applications from research at IUPUI

As a top urban research university, IUPUI researchers are expanding the frontiers of knowledge, addressing important national and global needs, and transforming knowledge into practices and solutions that improve people's lives, generate economic growth, and contribute to social wellbeing. Integrating a more robust communications and marketing strategy within the IUPUI research enterprise will solidify and boost the campus' reputation as a top-tier urban research university. As publishing and dissemination of information evolves, so do the ways that faculty demonstrate the impact of their scholarship. By providing free access to its research and scholarship, IUPUI will show its commitment to civic and community engagement, improve knowledge sharing for urban health and wellness (UHW), boost the scholarly reputation of the campus and its faculty, and facilitate translational and collaborative science. To assess the success of this, new tools and metrics must be developed that will benefit faculty seeking to document the impact of collaborative, community-based and translational research.

- Goal 5.1: Grow effective communication about campus-wide research activities
- Goal 5.2: Facilitate and increase dissemination of research and scholarship
- Goal 5.3: Support new research metrics to assess research impact at all levels
- Goal 5.4: Facilitate data management, reuse and archiving

Introduction

The IUPUI Research Strategic Plan is based on the initiatives presented in the "Innovation and Discovery through Research and Scholarly Activity" portion of the 2013 IUPUI Campus Strategic Plan. A Steering Committee was tasked by the Vice Chancellor for Research to develop an updated and more detailed IUPUI Research Strategic Plan as part of the IUPUI Campus Plan, and to coordinate this plan with the IU School of Medicine's Transforming Research Initiatives as well as the IU Vice President for Research's university-wide strategy.

To achieve these goals, the Steering Committee received input from the IUPUI Council of Associate Deans for Research, the IFC Research Affairs Committee, and a Campus Outreach Group that included partners external to the University. Input from the faculty, staff and broader community also was received through three Town Hall Meetings, and a series of Roundtable Discussions about the Grand Challenges during IUPUI's 2014 Research Day.

The goal for this strategic plan is to build on the unique strengths of the IUPUI campus and its academic units to promote research and creative activity that will have a positive impact locally, nationally, and globally on the health and well-being of individuals, families, and the society. The plan presents an integrated approach that uses outreach initiatives designed to enhance IUPUI's homegrown and unique strengths in applied research and community engagement. In all cases, these actions seek to enhance innovative, effective, and rewarding research and creative activities among IUPUI faculty and students by building on existing strengths and by addressing known weaknesses and inefficiencies. Some elements of these actions reflect national trends and "best practices" in research while others adhere to those IUPUI-specific practices that are responsible for our reputation as an inclusive and forward-thinking urban campus in disciplines ranging from the health and life sciences and STEM, to the social sciences, arts, and humanities.

The Plan is centered around the establishment of Grand Challenge Initiatives. Other aspects of the plan are intended to foster this primary goal. It proposes that the University focus its energies and its financial resources into areas that can have a significant impact. This will require greater organizational efficiencies and better coordination and collaboration among Schools. The Plan recognizes that traditional approaches to research and scholarly activity are changing, and will require alterations to the manner in which scholarly accomplishment is evaluated and rewarded. To this end, the Plan presents five Strategic Initiatives that emphasize greater cross-disciplinary research at all levels and scholarly programs that incorporate undergraduate and graduate student learning. Each initiative is accompanied by Goals and suggested Action Steps. Appendices for each initiative include: i) projected Timeline with specific implementation steps; ii) suggested Benchmarks by which to evaluate their effectiveness; iii) the offices that could be charged with the primary responsibility for assuring the progress of each initiative; and iv) projected costs (Appendix 2-6). All appendices are available upon request.

(1) Launch "Grand Challenge Initiatives"

"Grand Challenge Initiatives" are long-term "Big and Bold" research programs that address critical national and international quality of life issues by establishing cross-disciplinary teams of faculty and students who collaborate with the community at large, industry and government agencies.

Goal 1.1: Develop an Urban Health and Wellbeing (UHW) Grand Challenge within the next 3-5 years.

The Urban Health and Wellbeing (UHW) Grand Challenge has six pillars, which represent broad areas of research emphasis that will contribute to the economic growth and social advancement of Indiana, the

nation, and beyond and advance the public good to benefit humanity as a whole. These include research into Environmental and Human systems; Social Networks; Public Health and Medicine including Access to Healthcare; Economic Inequality, and Quality of Life issues. Each of these pillars includes several more focused areas of potential research that cross disciplinary boundaries, resting on the foundations of Sustainability, Economic Development, Education and Public Policy, which are components of all areas. The UHW Grand Challenge will focus IUPUI's energies on clear, targeted goals that maximize the University's potential to compete nationally for highly competitive research grants. It is expected that the "Grand Challenge Initiatives" will foster the growth of major high-impact and synergistic trans-disciplinary research and creative activities at IUPUI that are well supported by external funding sources. Locally, the Grand Challenge is intended to foster a campus culture of inquiry, creativity, and inclusiveness that will encourage faculty to engage in high-quality research and creative activities with each other, their students, and Indianapolis and its citizens. More details on the UHW Grand Challenge can be found in Appendix 1.

Action Steps

- Establish a Grand Challenge Planning Committee consisting of IUPUI faculty and administrators as well as community representatives from Central Indiana to develop the operational structure of the UHW Grand Challenge and oversee its implementation.
- Appoint an Executive Director and support staff to direct the UHW Grand Challenge and secure funding.
- Establish a community hub in Indianapolis that will serve as a gateway to seek input on UHW Grand Challenge research projects and disseminate research findings to the residents of Greater Indianapolis.
- Leverage the Signature Centers Initiative program in support of the Grand Challenge Initiatives to provide funding for UHW related research activities.
- Invite external speakers to educate/train IUPUI investigators on the various aspects of participatory community research best practices.

Goal 1.2: Improve and expand *cross-sector and translational* research activities and initiatives with industry, government, nonprofit and other community partners to address important local, national, and global needs.

Action Steps

- Create an active database of community-engaged researchers and scholars, review mechanisms for tracking community engagement, establish benchmarks and assess impact.
- Identify or establish funding streams campus-wide for support of community-engaged and globalization-relevant research projects.
- Grow research partnerships and initiatives with industry and other institutions on inventions and sale of commercial products through systematic development of programs and resources, which provide solutions to industry research and training needs.
- Encourage technology transfer as a performance criterion for faculty by expanding incentives for faculty and staff to engage in research commercialization.
- In collaboration with IURTC and the SpinUp program, develop a "road-map" for faculty and staff engagement in commercialization and start-up company efforts.
- Create a "Collaboratory"—a virtual and personal clearinghouse within OVCR to respond quickly and easily to research requests and opportunities from external entities through the establishment of a comprehensive database and social networks.
- Determine approach and budgetary support that emphasizes the importance of faculty research that is international and/or is focused on addressing the opportunities and challenges associated with globalization.

(2) Expand cross-disciplinary faculty research at IUPUI

IUPUI is known for the cutting-edge research of its faculty, research scientists, professional staff and students, and for the ability of its researchers and scholars to translate research into practical applications for the advancement of society. The academic diversity of the campus creates a rich environment that promotes inter- and multi-disciplinary discoveries and innovations. Federal funding agencies have been placing an increased emphasis on large-scale, team-based research initiatives to address complex and multifaceted problems that require cross-disciplinary collaboration.

Goal 2.1: Advocate for promotion and tenure guidelines that align faculty rewards with campus goals.

Promotions and Tenure policies should recognize changes that have occurred in recent years in faculty work and productivity. These include but are not limited to team science and other collaborative formats, technology transfer and commercialization efforts, as well as nontraditional forms of scholarship and creative activities.

Action Steps

- Develop incentives for faculty to participate in team science and other collaborative formats for complex project research in all academic disciplines.
- Develop and enumerate new incentives for faculty to participate in entrepreneurial and translational work.
- Track research productivity/creative activity for each academic unit based on measurable metrics: publications (including nontraditional scholarship), exhibitions, performances, commissions, public engagement projects, student research projects, entrepreneurial activity and funding attached to each outcome measure.
- Develop a new Promotions and Tenure policy that recognizes faculty accomplishment in areas related to creative work; team and public scholarship; mentoring of student research; and nontraditional forms of publication.

Goal 2.2: Provide guidance to schools to conduct coordinated recruitment

IUPUI should provide incentives to recruit new faculty into areas related to campus priorities (eg the Grand Challenges) through cluster hiring by the appropriate schools and strengthen efforts to diversify the faculty intellectually and culturally. Incentives could include partial salary support, following a model established by START, and central support of matching contributions for startup funds.

Action Steps

- Establish new mechanisms for coordinating faculty recruitments across schools through the Office of Faculty and Academic Affairs (FAA).
- Establish a pool of funds to facilitate cluster hires and high priority recruitments with equal contributions by the campus and by schools wishing to solicit other schools to partner in recruitment in high priority areas.

Goal 2.3: Explore new strategies and incentives to support research/scholarly productivity among all faculty.

Collaborative initiatives within or outside research center activities must have an avenue for support. Pooling and/or leveraging internal resources from several different school- and campus-based sources currently used to support research projects/programs could provide the flexibility to respond to either worthy small proposals, or larger requests for seed funding with the potential for greater return. Some of this funding should target expansion of support mechanisms specifically for creative and humanistic research, e.g. IU New Frontiers in the Arts and Humanities, and IUPUI Arts and Humanities Internal Grant Program (IAHI). In addition, funding is needed for faculty who encounter a funding gap to create greater stability in the research enterprise, and encourage retention of laboratory staff, who are already knowledgeable and trained.

Action Steps

- Implement a policy for return of a portion of indirect costs to any campus designated/recognized Research Center for extramurally funded proposals that were submitted through the Center or received Center support to cover administrative costs and ensure center sustainability.
- Establish salary savings programs within every academic unit to secure flexible funds that can be used as bridge funds by successful faculty.
- Track research productivity in measurable outcomes (goal 2.1) and internal financial support (measured in $) and other types of internal support (course release, graduate student assistants, travel funds in support of research) to establish correlation.

(3) Expand and integrate research experiences for undergraduates across all disciplines through the Grand Challenge Initiatives

IUPUI should establish opportunities for students to engage in, learn from, and contribute to the Grand Challenge initiatives. In doing so, IUPUI would be supporting proven "high impact" practices known to enhance engagement, student success and persistence. Special attention should be paid to ensuring that these experiences are available to students in all disciplines, and to students from traditionally underrepresented or marginalized groups. The goal by 2020 is to provide all IUPUI undergraduates with at least one experience relating to a Grand Challenge Initiative. These opportunities would be tiered from in-class research projects, to team-based mentored "field" projects, and ultimately to internship or capstone experiences.

Action Steps

- Develop a Grand Challenge Scholars' Program that recruits interdisciplinary teams of students to contribute to aspects of the Big and Bold Initiatives Program.
- Develop research opportunities in the Summer Diversity Research Scholars Program tied to the Urban Health and Wellness Grand Challenge Initiative.
- Develop plans in every school for engaging students in research related to the Urban Health and Wellness Grand Challenge Initiative.
- Develop and support a student-led Innovation and Entrepreneurship Center.
- Seek external funding to support undergraduate research tied to the IUPUI Grand Challenges Initiatives.

(4) Develop nationally recognized graduate programs in critical areas that cross disciplinary boundaries and expand campus capacity for graduate education

The Grand Challenge Initiatives are highly cross-disciplinary, and graduate programs at IUPUI should reflect this cross-disciplinarity. More formal cross-disciplinary Ph.D. programs will be needed to establish

curricula and facilitate the cross-training of students. Greater emphasis should also be placed on developing graduate partnerships and internships between university and industry laboratories. Different models for industry/university partnerships that support graduate training for IUPUI students should be explored.

Action Steps

- Encourage training grants that require interdisciplinary mentoring.
- Create formal cross-disciplinary tracks for existing PhD programs or other terminal graduate degree programs.
- Develop programs that cross disciplines from existing degree programs by engaging multiple faculty and programs involved with the Grand Challenge Initiatives.
- Establish Advisory Boards that include Community Partners to help identify research questions of community interest that could attract PhD students and also support the overall goals of the Grand Challenge.
- Merge PhD programs graduating fewer than 5 students in three years to reduce administrative burdens and enhance research productivity.
- Establish an Advisory Board of IUPUI investigators and representatives from local industries to develop graduate/industry partnership programs, identify research projects and select students.

(5) Encourage wider access to findings and applications from research at IUPUI

As a top urban research university, IUPUI researchers are expanding the frontiers of knowledge, addressing important national and global needs, and transforming knowledge into practices and solutions that improve people's lives, generate economic growth, and contribute to social wellbeing. Integrating a more robust communications and marketing strategy within the IUPUI research enterprise will solidify and boost the campus' reputation as a top-tier urban research university. As publishing and dissemination of information evolves, so do the ways that faculty demonstrate the impact of their scholarship. By providing free access to its research and scholarship, IUPUI will show its commitment to civic and community engagement, improve knowledge sharing for urban health and wellness (UHW), boost the scholarly reputation of the campus and its faculty, and facilitate translational and collaborative science. To assess the success of this, new tools and metrics must be developed that will benefit faculty seeking to document the impact of collaborative, community-based and translational research.

Goal 5.1: Grow effective communication about campus-wide research activities

Currently, multiple communication and marketing strategies are being implemented by various units across the campus to promote a diverse array of research and creative activity conducted by faculty, students and staff. Marketing and communications efforts must be centralized and strengthened in order to expand opportunities for research outreach, community-engaged research, and commercialization.

Action Steps

- Hire a full time communications and marketing professional within OVCR who will serve as the liaison between OVCR and other campus/university units to promote IUPUI's diverse and robust research enterprise, thus broadening its visibility and improving its reputation as a world-class research institution.
- Hire or consult with communication experts to develop a strategic communication plan and industry relation strategy to build awareness of IUPUI researchers and research strength.
- Establish quarterly meetings with key university leadership to develop and communicate research outreach and commercialization strategies to all stakeholders.

Goal 5.2: Facilitate and increase dissemination of research and scholarship

Current means of communication must be evaluated to determine whether they are effective in a new age of electronic media. Studies have shown when institutions maintain a collaborative, engaged, and connected environment they excel above their counterparts. This is especially true in large organizationally diverse institutions such as IUPUI. Today there are numerous tools available to facilitate collaboration. The emergence of "social" networking technology will accelerate enterprise-wide collaboration and communication. To increase interactive communications between previously siloed/insulated entities, a "virtual glass wall" can be created where information can be viewed, discussed and used by all invited members. Institutions are beginning to embrace this networking concept, with enterprise collaboration sites for their internal and external constituents.

Action Steps

- Complete a feasibility study to determine the viability of developing a Virtual Research Collaboration Network at IUPUI and launch such network if viable.
- To facilitate open access publishing increase availability of funds to support article processing fees.
- Launch at least one new open access journal to support the UHW Grand Challenge Initiative or another innovative, collaborative or translational domain of scholarship.
- Adopt opt-out open access scholarly archiving policies.
- Increase compliance with federal public access policies through campus-wide outreach and compliance tracking.

Goal 5.3: **Support new research metrics to assess research impact at all levels**

As publishing and dissemination evolves, so do the ways that faculty demonstrate the impact of their scholarship. Journal and publisher reputation may be supplemented with item level metrics. The tools and approaches to support these new metrics will benefit faculty seeking to document the impact of collaborative, community-based and translational research.

Action Steps

- Launch outreach and education services to encourage faculty to adopt ORCID author identifiers in order to "easily and uniquely attach their identities to research objects such as datasets, equipment, articles, media stories, citations, experiments, patents, and notebooks" (orcid.org).
- Support the adoption of researcher profiles by leveraging IUPUI's open access repositories, IUPUIScholarWorks and IUPUIDataworks.
- Deploy alternative metrics tools (e.g. ImpactStory, Altmetrics.com) within IUPUI's open access repositories.
- Offer training to faculty seeking to use new metrics in demonstrating scholarly impact.
- Develop guidance for faculty P&T committees regarding new research metrics and related tools.

Goal 5.4: Facilitate data management, reuse and archiving

Collaborative cross-disciplinary science often involves various data sources and large datasets. There is a need for adherence to consistent research data and knowledge management best practices as well as new approaches to address related cost and time increases.

Action Steps

- Provide workshops to support effective practices in data management, with an emphasis on data integrity, transparency, reproducibility and preservation.
- Develop data management and sharing plans for all UHW, Grand Challenge initiatives and Signature Centers.
- Track and report implementation of data management plans and reuse of shared data to participating research units.