

## **Purdue University North Central**

### **Large Scale Research and Infrastructure**

#### **White Paper Draft**

2/19/08

Discovery is defined by our mission as the creation of new ideas, knowledge, and products. Despite being one of the cornerstones in our mission statement, Discovery at PNC has not always been at the forefront. As we begin to plan out path for the next few years the commitment to scholarship, by both the faculty and administration, should be made an increasingly important priority. It is through this sort of commitment that we can clearly differentiate ourselves from 2-year technical institutions, and maintain an active faculty of the highest caliber. Towards this end, the LSR&I committee has identified nine areas (in six premises) that we feel are important for the advancement of Discovery on this campus:

- Establish a Center for Research at PNC
- Expand research opportunities for students and faculty
- Physical space, infrastructure, and institutional support for faculty to participate in research
- Generate a university-wide budget for Research/Discovery activities
- Revise, update and bolster budgets for professional travel
- Recruit externally funded scholars
- Develop “signature” discovery programs that provide high exposure for PNC
- Expansion of library resources and informational tech to support research at PNC
- Establish centers for Experiential Learning and Economical Development

### **Premise 1: Establish a Center for Research at PNC**

According to the Purdue University website (2008), Purdue North Central submitted a total of 10 proposals to Sponsored Programs at Purdue West Lafayette for the 2006-2007 academic year (1). Currently Sponsored Programs at Purdue West Lafayette provides support to Purdue North Central and all additional regional campuses that submit federal grants. All faculty must comply with WL guidelines, which may not be suitable for the regional campuses. In order to better serve the needs of the PNC faculty, and to better organize Discovery-based activities, we are proposing the establishment of a Center for Research.

#### Goals & Objectives:

- I. Ensure that all PNC grant proposals are compliant with the specifications.
- II. Enable PNC to obtain the information needed to directly submit a governmental proposal prior to the submission deadline.

## APPENDIX "G"

---

- III. Decrease the time required to both submit and obtain information related to the submission of federal grants by Purdue North Central (liaison to Sponsored Programs at Purdue West Lafayette)
- IV. Assist faculty in preparing and revising grant proposals, and provide information

### Strategies:

- A. Physical needs
- B. Support personnel
- C. Research support

### Action Items:

- A. *Physical needs*
  - Establish a centralized office for PNC's submission of federal, state and local grants
  - Establish a Director of Research at PNC with a support staff commensurate with the Discovery mission and resource availability at PNC
- B. *Support personnel*
  - Coordinate Discovery activities at PNC
  - Liaison to Sponsored Programs
  - Provide institutional and system-wide data
  - Obtaining information regarding federal grants and assist with budgeting
  - Remain fully equipped with all information pertinent to academic research
  - Provide access to pertinent information regarding federal grants and make such information more readily available to faculty and staff
  - Specialized in an array of academic areas in order to assist professors in such topics as revision, issues related to Institutional Review Boards, budgeting and submission
- C. *Research support*
  - Provide faculty the tools for meeting the Discovery mission of the campus
  - Host workshops for grant writing
  - Assist tenure track professors and others interested in research to obtain the information that they need in a timely manner.

### References

Purdue University (2008). Purdue University Sponsored Program Activity for Fiscal Years 1996-97 to Present, by School, Department, and Staff. Retrieved February 5, 2008 from Purdue University Website:  
<http://1061vweb15.itap.purdue.edu/sps/propawd.htm>

### Recommendations:

## APPENDIX "G"

---

Short term goals:

- Define Discovery at PNC and make it more of a priority.
- Change attitudes about the role of Discovery
- Commit to increasing support for Discovery as the campus continues to develop

Long term goals:

- Develop a Center for Research with minimal staff to assist faculty with Discovery activities

Assessment:

1. Determine the combined Discovery events at PNC by year
2. Survey faculty and administration about support for discovery

### **Premise 2: Expand research opportunities for students and faculty members**

Engaging undergraduates in research activities has always been important to PNC. Indeed, this is another area where this campus can distinguish itself from surrounding 2-year institutions. Furthermore, these activities capture and stimulate the imaginations of our students, and inspire them to greater levels of understanding and achievement. Unfortunately, many of students are unable to participate in these activities because of financial considerations, and limited faculty participation in scholarship.

Goals & Objectives:

- I. Stimulate student participation in research
- II. Increase faculty participation in research
- III. Increase diversity of students involved in research
- IV. Increase awareness of research activities
- V. Generate research assistantships and provide for faculty release
- VI. Dedicate space for research activities

Strategies:

- A. Participation
- B. Awareness
- C. Assistantship and Buy-out
- D. Physical space

Action Items:

A. *Participation*

1. Students that participate in research activities are able to expand their curriculum and will have hands-on experience valuable to future employers once they leave PNC. Research has been shown as a great retention tool for undergraduate students (CUR). Research is a great instrument to open the doors of the laboratory to more students and to increase the retention of such students at the undergraduate level. The

## APPENDIX "G"

---

exposure to different research experiences as well as training in logical problem solving will give students access to new science career paths and improvement in their communication skills. Students at PNC will be able to work one on one with faculty members in the research projects, an opportunity sometimes not available in bigger settings. Also, the inclusion of research as part of the curriculum will open more doors to a larger number of students.

2. Faculty members that participate in research are able to expand their knowledge in their area of expertise. Moreover, the faculty would be able to present their work at regional, national and international forums, giving them the opportunity to be known in platforms different than PNC. This in turn brings reputation to the faculty and PNC. Research opportunities on campus will also attract more qualified faculty, giving the students at PNC a way to learn from the experts.

3. This initiative will increase the diversity of both students and faculty members at PNC. Students from diverse backgrounds will be more inclined to attend PNC due to the increase in the number of research opportunities. Faculty members' diversity will also increase, as researchers from different backgrounds are attracted to the opportunities available at PNC.

### B. *Awareness*

1. The increase in research opportunities for the faculty will also increase the international awareness about PNC. Faculty members are able to present their work at regional, national and international forums, giving them the opportunity to be known in platforms different than PNC.

### C. *Assistantships and Buy-out*

1. The initiative will need to be funded. Funds need to be available in the form of graduate and undergraduate scholarships, grants, endowments, fund raising activities and money budgeted by the administration to be spent only in research activities. Also, faculty will need to be able to obtain time release and have the opportunity to "buy out" time when grants are awarded.

### D. *Physical space*

1. The increase in research opportunities will require increase in laboratory space available to faculty members to house their research groups and instrumentation. Facilities are needed that are in accordance with state and federal requirements for safety, including OSHA, EPA, etc. Moreover, facilities management needs to be aware of the environmental requirements of specialized instrumentation. Instrumentation and equipment will need to be acquired for faculty members' projects. However, the same can also be used for teaching projects. The time line for this project should be about 1-3 years.

## APPENDIX “G”

---

### Recommendations:

#### Short term goals:

- Increase opportunity for faculty and students to get involved in research.
- Establish a system for rewarding faculty participation in undergraduate research (e.g. load release, merit reward)

#### Long term goals:

- Commit to making undergraduate research a priority on the campus (e.g. budgeted funding for research)
- Provide more physical space available for research activities (see below)

### Assessment:

1. Number of publications by faculty and students
2. Number of presentations by faculty and students at local, regional and national meetings
3. Number of grants obtained by faculty
4. Number of faculty promoted in the academic ranks
5. Number of new faculty attracted and retain at PNC because of research initiatives
6. Number of students attracted and retain at PNC because of research initiatives
7. Number of students to attend graduate school and other professional schools

### **Premise 3: Physical space, infrastructure, and institutional support for faculty to participate in research**

In order to increase research productivity and support the Discovery mission, PNC needs to provide an environment conducive to those goals. Presently our facilities for research are largely non-existent, and the commitment to Discovery is minimal. Steps that require attention include:

- Modernized laboratories and project space
- Facilities that are supported by the institution that provide basic necessities
- An environment where benchmarks are set for Discovery, that are consistent with the mission

### Goals & Objectives:

Evaluate the current physical space, infrastructure, and institutional support for faculty to create a culture and an action plan to improve and increase undergraduate research.

### Strategies:

- A. Physical space modernized and increased
- B. Infrastructure created that is fluid and transparent
- C. Institutional Support for Faculty that is fluid and transparent

## APPENDIX "G"

---

### Action Items:

#### A. Physical space

1. Evaluate current labs, instruments, hardware, software, technical support, and research space for the purpose of creating an action plan and implementation
2. Modernize labs, instruments, electrical and plumbing utilities, telecommunications capabilities (smart labs)

#### B. Infrastructure

1. Year-round access to high quality research
2. Mid-year and year-end evaluation and assessment of labs/research programs to ensure they remain in the best of conditions for continued growth of undergraduate research
3. Earmark operating funds for instrument and lab maintenance and repairs
4. Start-up funds for faculty establishing research programs
5. Establish a research culture that is marketable external stake holders and students to
6. Share research spaces to maximize current limited resources
7. Evaluate current teaching loads to ensure faculty are available to supervisor and participate with the undergraduate research (quality research)
8. Prioritize increasing full-time tenure track faculty
9. Educate support staff about the sensitivity of science labs with chemicals that are sensitive to temperature, etc
10. Expand library resources; market these resources to all stake holders
11. Decrease part-time faculty

#### C. Institutional Support for Faculty

1. Define faculty driven/supported undergraduate research across disciplines
2. Teaching labs
3. Add student interns or qualified/certified staff to maintain labs and resources

### Recommendations:

#### Short term goals

- Continue the clean up/painting/purchasing of new equipment as appropriately needed and resources are available

#### Long Term Goals:

- Construct a Science-Laboratory building with adequate space to support these activities

### Assessment:

1. Consult external and internal reports about status of research laboratories
2. Determine the amount of space dedicated to research/discovery (sq. ft.) as a measure of commitment.
3. Measure changes in faculty/student participation in research.
4. Long-term monitoring of graduating students to determine if benefit exists

## APPENDIX “G”

---

### **Premise 4: Recruit external funded scholars**

Recruiting external funded scholars is important to help PNC develop intellectually vibrancy; provide faculty research opportunities and appropriate student learning experiences; and increase financial resources.

#### Goals & Objectives:

- I. To establish and strengthen the partnerships with Purdue West Lafayette.
- II. To develop partnerships with other educational institutions.
- III. To establish and strengthen the partnerships with state and federal agencies and national laboratories.
- IV. To establish and strengthen partnerships with private sector companies.

#### Strategies:

- A. Purdue West Lafayette support*
- B. Other educational institutions support*
- C. State and federal agencies support*
- D. Private sector companies support*

#### Action Items:

- A. Purdue West Lafayette support*
  - Establish interdisciplinary research partnerships with Purdue Research Park and Purdue Discovery Park.
- B. Other educational institutions support*
  - Identify and pursue opportunities with other educational institutions that provide potential for external funding.
  - Develop and maintain collaborative federal research initiatives with other universities.
- C. State and federal agencies support*
  - Identify potential state and federal partners that could provide benefit to PNC
  - Establish formal partnership agreements with agencies and laboratories.
  - Publicize the results of successful partnerships.
- D. Private sector companies support*
  - Identify companies that would be interested in associating with university instruction and research programs.
  - Establish formal partnerships that significantly advance PNC’s programs.
  - Publicize successful partnerships with private sector companies.

#### Recommendations:

## APPENDIX “G”

---

Short term goals:

- To increase external sponsored scholars by one scholar position at each school by 2013.

Long term goals:

- To build and support strategic partnerships that expands PNC research.

Assessment:

1. Monitor faculty involvement in research
2. Measure changes in faculty/campus-wide research productivity
3. Survey to determine if strategic partnerships increase opinions about agencies and PNC.

### **Premise 5: Develop “signature” discovery programs**

Many institutions of higher education have “signature” programs for which they are known. PNC, for example, has a reputation in the region for its Elementary Education and Nursing programs. Unfortunately, we have no equivalent reputation for research. In part, this can be attributed to limited resources allocated to develop this aspect of the mission, and in part this can be attributed to limited faculty/student involvement in the Discovery mission (see above). PNC would benefit by investing resources to develop a few “signature” research programs. Such programs would not only increase the regional visibility of the University, but should also increase our reputation as an institution of higher learning and center for collaboration.

Goals & Objectives:

- I. Develop and expand relationships with industry, governmental agencies and school systems in the regional
- II. Specifically target for funding and development research programs that have significance to these agencies

Strategies:

- A. Identify areas of opportunity in the regional community
- B. Purdue North Central Support
- C. Seek out federal and other grants for support of the programs

Action Items:

## APPENDIX "G"

---

- A. Develop relationships in the community that require or would benefit from research expertise*
- B. Provide physical space and support for Discovery in areas of specific interest or need*
- C. Expand Discovery activities*

### Recommendations:

#### Short term goals:

- Develop relationships within the target community
- Look for opportunities to expand into a specific research niche in the region
- Seek grants and other funding to support specific program
- Provide space to expand opportunities (see above)

#### Long term goals:

- Establish a center to coordinate research efforts to meet community needs

### Assessment:

1. Monitor relationships in the community and community opinion of PNC
2. Monitor student enrollment/retention in hallmark programs
3. Survey graduates following graduation

## **Premise 6: Experiential Learning Lab for the Construction Industry and Economic Development Center\***

\* These items are not necessarily related to the concept of Discovery alone, but involve changes in infrastructure that would benefit several areas of development.

### **Experiential Learning Lab**

Establish an Experiential Learning Lab for the Construction Industry in Northwest Indiana that will benefit students, the construction industry, and the community. Purdue University North Central, Purdue Calumet, and the Construction Advancement Foundation (CAF) shall collaborate in a public-private partnership to seek grant funding and CAF Board of Director support to establish a physical building location in Portage, IN for a Construction Management Safety Lab in Northwest Indiana. This collaboration recognizes:

- Safety is an utmost priority and concern for the construction industry
- Degree programs in Building Construction Management require experiential learning

## APPENDIX “G”

---

- Adult learners understand best by “doing”, thus experiential learning is appropriate for established construction workers and supervisors in NW Indiana
- An experiential learning lab is non-existent in NW IN for this endeavor and must be established if it is to exist.

### **Economic Development Center**

Northwest Indiana needs to position itself to capture opportunities for economic development and renewal. Purdue North Central is strategically placed as neutral ground to provide technical and policy analysis expertise to development agencies and the private sector. It is proposed that an economic development center be established at Purdue North Central. The Center would have two primary functions: applied research and training. The applied research function would assist businesses on issues related to applying technology to business practices (applied engineering and science) and marketing and business planning (business). The applied research function could also assist governmental and economic development agencies on issues such as infrastructure (water, sewer, transportation) and land use planning and development. (economics and engineering). The training function would assist the business and governmental communities in fulfilling targeted workforce training needs to enable business to compete more effectively in the marketplace. (could involve any of the colleges on campus).

### **Goals & Objectives:**

- I. To conduct an assessment survey of CAF members to determine the most needed safety training topics for construction supervisors and for construction workers.
- II. To determine the role of Purdue North Central’s Center for OSH, Purdue North Central’s Building and Construction Management students and faculty, Purdue Calumet constituents, and CAF to realize the goal of establishing this lab for NW Indiana.
- III. To work collaboratively in order to secure National Science Foundation (NSF) Curriculum Improvement funds in order to improve the Construction Safety credentialing and instruction at Purdue North Central and to improve the General Industry credentialing and instruction at Purdue Calumet.
- IV. To work collaboratively to communicate the opportunity and need to the Board of Directors of CAF and illicit their support through the upcoming strategic planning process.

### **Strategies:**

- A. Purdue North Central Support*
- B. Purdue Calumet Support*
- C. CAF Support*
- D. National Science Foundation Support*

## APPENDIX "G"

---

### **Action Items:**

- A. *Purdue North Central Support*
  - Establish Prof. Sarah Sanders Smith as a co-PI on the NSF grant application and process
  - Determine the experiential learning needs of BCM and perhaps other Engineering/Technology students on this campus
  - Communicate to all PNC constituents to determine training needs and subsequent opportunities
- B. *Purdue Calumet Support*
  - Establish Shoji Nakayama and other pertinent faculty as co-PI's on the NSF grant application and process
  - Determine the experiential learning needs Engineering/Technology students on this campus
  - Communicate to all PNC constituents to determine training needs and subsequent opportunities
- C. *CAF Support*
  - Confirm the CAF Board of Director's interest and commitment to this project
  - Design the training facility, to be built and designed by CAF contractors near their existing office facilities
  - Secure all permits and site surveys needed to proceed with the building project
  - Include this project in the 2-3 year strategic plan of CAF to establish the physical structure
- D. *NSF Support*
  - Complete the grant application for \$150,000 x 3 years with Shoji Nakayama as the principal author
  - Travel to NSF in March to determine feasibility of the grant project application

### **Recommendations:**

#### Short term goals:

- Design and distribute the CAF training needs assessment
- Submit the NSF grant application by May of 2008
- Confirm the initial commitment by the CAF Board of Directors to this project

#### Long term goals:

- Secure grant funds via NSF, NIOSH, or OSHA to secure the training equipment needed for the lab and beginning training initiatives

## APPENDIX "G"

---

- Establish CAF's dedication and involvement via their upcoming strategic planning process
- Construct the lab in close proximity to the existing CAF offices in Portage, IN to provide an equal distance learning opportunity for Purdue North Central and Purdue Calumet students
- Determine a training schedule to accommodate both campuses, CAF and the PNC Center for OSH in order to conduct training at this facility

## APPENDIX "G"

---

### **Large Scale Research and Infrastructure Working-group Members and Dates**

#### **Members:**

Chris Holford, Department Chair Biology and Chemistry (Chair)  
Carin Chuang, Assistant Professor of Computer & Information Technology  
Carol Kurmis, Assistant Director of Career Development  
Dave Pratt, Assistant Professor of Education  
Janell Irving, Grants Writer  
Roger Tharpe, PNC Student  
Rosa Rivera-Hainaj, Assistant Professor of Chemistry  
Tape Brahmasrene, Professor of Business

#### **Committee Meeting Dates:**

1/11/2008	Team Meeting
1/24/2008	Team Meeting
1/30/2008	Team Meeting
2/7/2008	Presentation Review
2/7/2008	Open Forum on LSR&I
2/14/2008	Team Meeting