

## **WPI PBL Application – Creighton University**

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Our team includes a sixth member to allow our Associate Dean of Humanities and Fine Arts, Tracy Leavelle to attend. T.L. is a former chair of the history program and is a key player in the development of the new digital humanities program at Creighton.

### **Creighton University Enrollment:**

The enrollment at Creighton University is approximately 4,000 undergraduates with about 4,000 postgraduate students enrolled in a variety of masters and health professions programs.

### **Application Approval:**

Our application is approved by the Dean of Arts and Sciences, Dr. Bridget Keegan ([bmkeegan@creighton.edu](mailto:bmkeegan@creighton.edu)) and our chief academic officer, our Provost, Dr. Edward O'Connor ([EdwardOConnor@creighton.edu](mailto:EdwardOConnor@creighton.edu)). We commit to attending the institute if our proposal is accepted.

## **Application Project Description:**

**Goals:** What high-priority tasks do you expect your team to work on during the Institute? (These should be the tasks that, if advanced substantially during the Institute, would lead your team and campus to judge your efforts a success.)

Creighton University implemented a new core curriculum during the 2014-2015 academic year. This new core curriculum, the Magis Core, is built explicitly on a foundation of learning objectives tiered in such a way as to make learning an integrative process. Courses in the new core are categorized at the Foundations, Explorations, or the Integrations level. Doing Natural Sciences, Doing Social Sciences, and Intersections (a multi-disciplinary humanities course) are component classes that are part of the Integrations level of the core. As the name implies these courses are meant to give students a hands-on immersion into the social or natural sciences or the humanities. Students will conduct experiments, analyze questions, and participate in direct inquiry in these fields. These courses, and the learning objectives behind them, explicitly call for active engagement pedagogies such as project-based learning.

Our proposed goal for this institute is to develop a set of courses in a variety of disciplines that would use project-based pedagogies to satisfy the learning objectives for the Doing Natural/Social Science and Intersections Magis core courses. But in addition to individual core components, we hope to create a structure that encourages, supports, and sustains interdisciplinary collaboration by faculty engaged in project-based learning as a major part of a diverse, campus wide pedagogical community.

Based on our team's past experiences with the implementation of PBL courses at Creighton, we also feel we would greatly benefit from consulting with experts at the institute on the following issues:

1. Student resistance to non-standard (i.e. not lecture-based) teaching practices.
2. Assessment of learning objectives using PBL artifacts as opposed to more traditional assessment methods.
3. Faculty development to encourage wider adoption of PBL.

**Need and readiness:** What is the current state of project-based or engaged learning on your campus, and what has motivated a desire for reform or action? Have assessment results prompted change, or do you need help creating an assessment plan? Has a unified vision of the planned reform emerged?

Project-based learning exists in small pockets on Creighton's campus and is the result of faculty members primarily working alone in their own disciplines. For

example, within physics, the team leader (G.D.) has used project-based pedagogy to teach an upper division physics course, Quantum Mechanics, with little or no time devoted to traditional lectures since 2011 ([http://physicsweb.creighton.edu/pbl\\_quantum](http://physicsweb.creighton.edu/pbl_quantum)).

G.D. and R.C. have jointly developed a freshmen level, year-long PBL course, Modeling the Physical World, which pairs General Physics I and II with Calculus II and III. Due in part to a lack of faculty development, however, there has not been wide adoption of PBL on Creighton's campus.

Why is this the right time for PBL at Creighton? With the adoption of the new core, there is a general sentiment in the Creighton faculty that one outcome of the new core should be to increase the overall pedagogical diversity of courses. Students should experience different modalities and different ways of teaching and learning. As such there is an extremely high-level of interest amongst faculty in non-traditional pedagogies. This institute is an opportunity for a small, but highly excited and energetic cadre of faculty to create a critical mass of PBL practitioners at Creighton.

The Magis Core has developed an extremely ambitious and detailed assessment plan. Since the core is built from learning objectives, any attempt to satisfy the Doing Natural/Social Science/Integrations component of the core must absolutely involve a robust assessment of student learning surrounding those learning objectives. As we stated earlier, one of our goals for our participation in the institute is to learn how to better assess student learning in project-based learning courses.

**Team characteristics:** In what ways do your team members reflect the opportunities for implementing project-based learning on your campus? How do they reflect the diversity and the various interest groups on your campus?

The faculty comprising our team come from a diverse set of disciplines and represent several of the major stakeholders in the Doing Natural/Social Science and Integrations core requirements. In many ways, STEM faculty at Creighton have been the drivers of pedagogical innovation on campus. Our team includes a mathematician, a chemist, a physicist, and a biologist, several of which are the chairs of their respective departments. However, it is critical for the implementation of our core to include social scientists and humanists in the process of development as well. Our team includes a faculty member from psychology, who will soon assume the chair of that department and will be in a position to help support the offering of needed doing social science courses. T.L. is both an associate dean of the College of Arts and Sciences as well as a former chair of the history department. All of these faculty members are leaders on our campus and well-respected by their peers. M.R., for example, is the current president of the Arts and Sciences faculty senate.

We have built our team with faculty from disciplines that have the most pressing need to develop new courses for the Magis Core. For example, the only doing natural science courses for non-majors are currently offered through the physics department; both chemistry and biology have a pressing need to develop their own courses for this component. Mathematics is looking to revise current project-based courses in the core. Furthermore, changes to the MCAT have developed a pressing need to bring more social science content to pre-med students. The psychology department is a key player in this area. Additionally, Creighton's new digital humanities program is striving to incorporate PBL into their curriculum.

**Contributions:** What do you believe your institution can contribute to the Institute?

Having recently completed a core revision, our team from Creighton is in a unique position to contribute to this institute. Part of the core revision process was extensive campus conversations about teaching and learning, as well as assessment. Alternative pedagogies have been, in a sense, forefront in our minds. Part of the development of the new Magis Core has been extensive work on assessment.

Two of our team have been recognized as Carnegie Foundation/CASE Professors of the Year (one for the state of Nebraska and one at the national level). G.D. actively studies the use of reflection and changes in student epistemologies in project-based learning courses in physics. Many of us have worked on the implementation of project-based learning courses within our own disciplines. We feel that in addition to the PBL experts from WPI we will be helpful colleagues to other teams and will be able to contribute across disciplinary lines in many contexts. We are seeking an engaging experience where we both help others meet their institute goals as well as work on our own.