

# SUNY CORTLAND ACADEMIC PROGRAM INNOVATION GRANT 2016-2017 Application

Applications are due in the Faculty Member's Dean's Office by November 1, 2016.

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Title of Project:  Cultivating student-centered pedagogies to enhance engagement

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## **Funding Areas**

Please identify which area is most closely aligned with your project

Innovation in Graduate Programming

Innovation through Equipment Procurement

X  Innovation Through Teaching and Learning

**Purpose:** The Academic Program Innovation Grant Fund has been created to support faculty led projects which demonstrate potential to improve academic programs so they are better positioned to attract, retain, and engage students. Funding typically will not exceed \$10,000.00 and should be expended within two years.

**Applicant Eligibility:** Tenure-track, tenured faculty, and full-time lecturers and professionals.

**Project Proposal:** The proposal should include a detailed project description (approximately 3-5 pages) which should include the following:

- Goals of the project
- Description of project activities
- How project outcomes will be assessed and disseminated
- Project personnel and timeline

The project proposal should include a detailed budget and budget justification.

**Criteria:** Proposal will be rated on the quality of the following elements:

- expected impact of the innovation on program quality as it relates to student recruitment, retention, engagement, and/or learning;
- extent to which proposed project builds or increases collaboration across the college;
- strength of the plans to assess and disseminate project outcomes;
- alignment of budget to project activities.

## Cultivating Student-Centered Pedagogies to Enhance Engagement

### *Background*

Problem Based Learning (PBL) is a student-centered pedagogical method aimed at engaging students with content through the investigation of real-world problems. Unlike more traditional, lecture-based instruction, PBL uses an active learning approach where students gain knowledge about discipline specific concepts within the context of the problem and further develop their understanding through the application of the acquired knowledge in developing a solution (Hmelo-Silver, 2004). The use of PBL aligns well with the recent focus in education on the teaching of the 21<sup>st</sup> Century Skills. These include critical thinking, problem solving, communication, collaboration, and creativity and innovation (Kivunja, 2014). Thus, PBL can serve as a powerful approach for both increasing student interest and more authentically preparing students who are career and graduate school ready.

When properly implemented and supported, PBL has been shown to positively affect long term retention of content, skill development, and overall student satisfaction (Strobel & van Barneveld, 2009). A study examining mathematics achievement in high school students also demonstrated that normally low-achieving students and minority students showed statistically significant gains in understanding when PBL was implemented (Han, Capraro, & Capraro, 2015). Additionally, retention of students has been shown to increase when PBL was used as a course approach suggesting that PBL may play a role in helping to integrate students into university life (Williams *et al.*, 2009).

Implementation of problem-based learning requires a shift in thinking with respect to both curriculum design and in its approach to teaching and learning. When considering the important elements of PBL, the following should be included (Hmelo-Silver & Eberbach, 2012 as cited in Tawfik, Trueman, & Lorz, 2014):

1. A project that includes student-centered learning goals
2. A challenging problem or question serving as the catalyst for learning
3. An inquiry approach that involves discussions centered on an ill-structured problem
4. Authentic, real-world connections
5. Student self-autonomy over some decisions or aspects of the project
6. Collaborative group learning opportunities

In order to properly implement the elements described, instructors must move from the more traditional role of expert or “sage on the stage,” to a guide or facilitator of learning. This may be a difficult switch for instructors as they begin to provide more of a support or mentor role (Jones, *et al.*, 2013). Therefore, training around what PBL is and strategies for designing and implementing problems is essential to success. Indeed, a pilot project conducted on our own campus found that participants required both initial and follow-up training to support them through the PBL process. In our pilot, supported by a Center Of Innovation in Education grant from the SUNY Chancellor’s office, we created a small group of PBL faculty fellows who received stipends and professional development through two PBL workshops between spring 2015 and summer 2016 (two workshops provided by Dr. Mark Serva, a higher education PBL

expert at the University of Delaware; and Joanne Keim, an OMC BOCES PBL trainer for the area school systems). A recent survey (see Appendix) of the Cortland PBL faculty fellows found that, of the 22 respondents, 82% are currently using the PBL approach in their courses while 100% of survey participants requested additional professional development. Specific areas cited for additional workshop include:

1. Enhancing student ownership and engagement
2. Authentic problem/project development
3. Connection of PBL projects with outside groups (business, community, etc.)
4. Utilizing technology in the PBL classroom and Flipped Classroom strategies

The purpose of this project is to expand on our PBL Fellows pilot to implement a broader, professional learning community approach to PBL training and implementation. Specifically, we propose a structure that provides an opportunity for faculty across schools and content areas to receive training and meet regularly to design and evaluate PBL course activities. Through the use of these learning communities, our goals are to 1) to provide enhanced PBL professional development and support PBL trained faculty to encourage full realization of PBL outcomes of enhanced student engagement and learning and 2) to provide a multi-faceted assessment of PBL at the campus to measure extent of PBL implementation and student engagement and student learning outcomes resulting from use of PBL projects/problems.

### ***Project Outline***

Grant activities have been designed to address those needs identified by the PBL Faculty Fellows pilot along with providing a multifaceted assessment of PBL implementation at SUNY Cortland.

**Project Objectives.** The objectives of the proposed work are to 1) provide enhanced PBL professional development across campus; 2) support PBL trained faculty in implementation and assessment of problems/projects using Professional Learning Communities; and 3) to assess the impact of PBL implementation on student engagement and student learning outcomes.

**Professional Learning Communities.** Professional Learning Communities (PLC) can be defined as a community of educators sharing and critically reflecting on their practice in an ongoing, collaborative way for the collective purpose of enhancing student learning (Stoll *et al.* 2006). Studies suggest that well-developed PLCs can have a positive impact on both teaching practice and student achievement (Vescio *et al.*, 2008). In order to provide support for implementing strategies learned at PBL Professional development opportunities, we will establish 4 Professional Learning Communities (PLCs):

- Professional Studies PLC
- Education PLC
- Math and Science PLC
- Social Science and Humanities PLC

Faculty from each of the curricular areas cited above will be invited to join their PLC and one member will be recruited to be the PLC facilitator. This could be a rotating position by semester.

A member of the Planning Team will act as an additional participant on each PLC and will keep assessment data from PLC meetings.

**Professional Development Whole Group Meetings.** We will hold 3 whole group meetings (February 2017, September 2017 and May 2018) with all 4 PLCs coming together for professional development and sharing of progress on PBL projects. The February 2017 meeting will include a kick-off to the PLCs and a session by an outside facilitator to provide professional development on the need area of Building Authentic Problems/Projects. The September 2017 meeting will focus on sharing of PBL projects and a work session to clarify plans for the 2017-18 academic year. The May 2018 meeting will include the participants sharing PBL project/problem implementation results along with student engagement and student learning outcomes

**PBL Seminars.** There will be 4 PBL seminars that address other needs indicated in the PBL Faculty Fellows Survey. These include:

1. Building Strong Community/Industry Partnerships
2. Flipped Classroom and other PBL Technology techniques
3. Student Engagement/Ownership
4. Assessing Group Work

**Assessment Plan:**

Focus of assessment will be on (1) faculty perceptions of PBL implementation, student engagement, and student learning and (2) student perceptions of engagement and learning in PBL courses

**Student and Faculty Surveys.** By using results of the National Survey of Student Engagement (NSSE) taken by SUNY Cortland students in 2016 and the Faculty Survey of Student Engagement (FSSE) to be collected by SUNY Cortland faculty in 2017, we will analyze individual data items (to be provided by Institutional Research (confirmed in an email to Associate Provost Van Der Karr and IR Director). We will use these items to survey faculty and students engaged in PBL projects during the 2017-18 school year and compare those results with that from the larger population.

**PLC data logs.** Planning team members will keep data logs of questions and concerns that arise in each PLC.

**Participant Survey Data.** We will gather data from surveys on PBL implementation and students engagement and learning from both Faculty and Students. Surveys will include sections that address PLC goals, student learning, overall implementation of PBL, and technology enhancements.

**Dissemination:**

Campus Dissemination: Sandwich Seminar and Public Report

Broader Dissemination: Conference Presentation and/or Journal Article Submission

## Timeline

Date	Project Activities	Project Assessment
December 2016	Planning Team meets to begin work	
December 2016/January 2017	Call for PLC facilitators and participants	Apply for IRB Approval for Assessment Plan
February 2017:	Whole group PD focusing on authentic problem/project development and kick-off of PLCs	<p>Look at SUNY Cortland NSSE/FSSE data</p> <p>Each PLC will set goals for the 2017-2018 academic year and participants will provide a self-assessment at the end of the 2018 academic year.</p> <p>The Planning team members will keep a log of questions and concerns that arise in each PLC.</p>
March 2017-May 2017	PLC Meetings and PBL Seminar 1	
September 2017	Whole Group PD	Gather participant survey data on implementation of PBL in during the 2017-18 academic year
October 2017–April 2018	PLC Meetings PBL Seminars 2, 3 and 4	<p>Gather participant survey data on implementation of PBL in during the 2017-18 academic year</p> <p>PLC members and their students will be given a subset of questions from the NSSE and FSSE.</p>
May 2018	Whole Group PD	Gather participant survey data on implementation of PBL in during the 2017-18 academic year
Fall 2018	PLCs continue (without funding)	Assessment Data Analyses and Dissemination

### Literature Cited

- Han, S., Capraro, R., & Capraro, M. M. (2014). How Science, Technology, Engineering, And Mathematics (Stem) Project-Based Learning (PBL) Affects High, Middle, and Low Achievers Differently: The Impact of Student Factors on Achievement. *International Journal of Science and Mathematics Education*, 13(5), 1089–1113.  
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- Jones, B. D. , Epler, C. M. , Mokri, P. , Bryant, L. H. , & Paretti, M. C. (2013). The Effects of a Collaborative Problem-based Learning Experience on Students' Motivation in Engineering Capstone Courses. *Interdisciplinary Journal of Problem-Based Learning*, 7(2).
- Kivunja, C. (2014). Innovative Pedagogies in Higher Education to Become Effective Teachers of 21st Century Skills: Unpacking the Learning and Innovations Skills Domain of the New Learning Paradigm. *International Journal of Higher Education*, 3(4), 37–48.
- Stoll, L., Bolam, R., McMahon, A., Wallace, M., and Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change*, 7:221–258
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- Tawfik, A., Trueman, R. J., & Lorz, M.M. (2013). Engaging non-scientists in STEM through problem-based learning and service learning. *Interdisciplinary Journal of Problem-based Learning*, 8(2).
- Vescio, V., Ross, D., and Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education*, 24: 80–91.

## **Budget**

### **Personnel:**

PCL Facilitators: 4 facilitators x \$250 per semester x 3 semesters = \$3,000

PD Presenters: 6 workshop presenters x \$800 = \$4800

Assessment and Reporting: \$250 per person x 4 = \$1000

Personnel Total: \$8800

### **Refreshments (coffee and cookies via ASC):**

Whole Group PD meeting refreshments \$260 (\$5.20 per person X 50) x 3 meetings = \$780

PBL Seminar refreshments: \$130 (\$5.20 per person x 25) x 4 seminars = \$520

Refreshment total: \$1300

**Total Request: \$10,100**