

Special Session: Leading and Administering Transformative Change in Education beyond Disciplinary Boundaries

Jeffrey J. Evans
School of Engineering Technology
Purdue University
West Lafayette, Indiana 47907
Email: jje@purdue.edu

Justin Seipel
Michael T. Smith
Polytechnic Institute
Purdue University
West Lafayette, Indiana 47907
Email: jseipel, smith859@purdue.edu

Abstract—One of the first artifacts produced by a massive multi-year education transformation effort has been the launching of a one-of-a-kind program focused on *transdisciplinary* studies that goes well beyond conventional notions of disciplines. One of the main thrusts of the transformation was to intentionally and repeatedly integrate STEM and Humanities learning and outcome assessment of skills and abilities needed for the 21st century. The challenges of creating and sustaining systemic shifts in culture and operational systems at a large campus have been many, and sometimes controversial. This special session will provide attendees with information and active engagement in a dialog about the motivations, design, and implementation of significant systemic change. Attendees will take away insights not only from what is presented, but also active engagement in transdisciplinary conversations. This session aligns with FIE's focus on innovations in program design and classroom techniques.

I. DESCRIPTION

Beginning in August 2013 Purdue University's College of Technology embarked on a massive multi-year transformation of the entire college. The breadth of the undertaking was significant enough to motivate the renaming of the College, one of ten at Purdue, from the College of Technology to the Purdue Polytechnic Institute. Motivation for the transformation came from a variety of sources. Employers are seeking more collaborative and information literate graduates more capable of navigating the changing global landscape of work in the 21st century [1]. Others, like David Price [2] and Tony Wagner [3] offer insights into the future of work and learning as well as how to guide young people to be innovative thinkers. More recent efforts of STEM education change at Cal Poly San Luis Obispo [4], the University of Illinois [5] and Olin College [6] not only served as exemplars, but directly assisted in providing guidance toward creating a learning environment to prepare graduates for life in the 21st century.

One of the first educational artifacts produced by this effort has been the launching of a one-of-a-kind program focused on *transdisciplinary* studies that goes well beyond conventional notions of disciplines. One of the basic values

of the program is to intentionally and repeatedly balance and integrate Humanities, Arts, Business and STEM areas. To realize the program, administrators, faculty, and in many cases students were required to collaborate in ways that transcended their individual worldviews. They needed to become transdisciplinary.

II. GOALS AND NOVELTY

The goal of this session is to actively engage and inform those who are considering or already actively innovating and transforming a program, department, college, or institution to move well beyond disciplinary boundaries. In particular, we are interested in transformations that seek to integrate education across STEM, Humanities, Arts, and Business areas. In addition to those considering these possibilities, we seek active participation and contributions from those who have actively been involved in such efforts to share, learn, and network with others who may be experiencing similar challenges and learnings.

We expect participants will be interested and excited about the session topic since large transformative changes beyond disciplinary boundaries do not occur frequently in higher education. This is a unique opportunity to learn from participants actively engaged in leading and administering transformative change, as well as to interact with others who may be considering similar changes. This session may be most relevant for those who are interested in the challenges of leading and administering such change, though all participants are invited regardless of what role they intend to play in their institution.

III. INTERACTIVITY

This unique interactive session has been designed by leaders and administrators of an on-going multi-year transformation effort at Purdue University. Purdue's Polytechnic Institute has embarked on a massive multi-year transformation of an entire college, crossing a wide variety of disciplines,

and has launched a one-of-a-kind program focused on transdisciplinary studies that goes well beyond conventional notions of disciplines. Many lessons learned from our experience leading and administering this change have provided context for the design of this interactive session, and expert participants from Purdue will be present to provide an overview, context for interactive components, and to generally facilitate and answer questions.

The interactions of the session will invite both beginner and experienced innovators, leaders, and administrators to engage in collaborative activity as well as share ideas and experiences regarding respective home institutions. We seek to create an inviting environment for everybody to share learnings and insights into challenges, lessons learned, best practices and opportunities.

IV. CONTENT AND AGENDA

The 80-minute session will open with a brief overview of transformative change in education, followed by a case study of Purdue's Polytechnic Institute. There are two highly interactive portions of this session that follow. In one, the participants will experience first-hand some of the common difficulties that occur when attempting to work across and integrate many disciplines into a project. In the second interactive portion, participants learn from each other about the particular challenges and opportunities at respective home institutions.

0:00-0:15 - Overview: A brief presentation of key concepts regarding transformation in higher education, as well as concepts of working with multiple disciplines and departments. Institutional and federal education policy challenges and opportunities will also be presented.

0:15-0:30 - Case Study: A brief example based on the Purdue Polytechnic Institute and introduction of the facilitators in the room.

0:30-0:50 - Transdisciplinary Interaction Exercise: Participants will be invited to join others at tables in a seemingly simple activity to agree on a common definition for a term, such as innovation or competency, but the activity is designed to reveal that individual and disciplinary perspectives can make even a simple activity challenging. After group work, tables will report their findings back to the whole room.

0:50-1:10 - Sharing Organizational Challenges: Lastly, participants will engage in both table work and report outs to share change efforts/interests and challenges at their institution.

1:10-1:20 - Conclusions: To end the session, final reflections and thoughts will be invited from participants and also shared by facilitators. All will be wished well and invited to continue talking and networking to help each other move forward at respective institutions.

V. TAKE AWAYS

We expect that participants will have a greater understanding of major change in higher education, specifically that which seeks to go well beyond conventional notions of disciplines. We anticipate that the session will also help facilitate the development or strengthening of networks of education innovators, leaders and administrators dealing with the unique challenges of highly interdisciplinary and transdisciplinary change. We will invite participants to share contact information with each other to facilitate networking.

VI. FACILITATORS

All three facilitators have been instrumental in creating and implementing Purdue University's first competency-based degree program. The Transdisciplinary Studies in Technology program features students developing their own plan of study to follow their passions and professional interests under the guidance of an adviser and faculty mentor. Students develop and demonstrate broad competencies that transcend disciplines and prepare them for life in the 21st century.

Professor Jeffrey Evans has taught electrical and computer engineering technology courses for over fourteen years. Since 2013 he has been immersed in competency-based education practices that combine Humanities and STEM disciplines in learning environments that transcend disciplines. He is also an avid musician (flugelhorn) and composer.

Drs. Justin Seipel and Michael Smith are Transdisciplinary research and education specialists respectively, with combined research and classroom experience spanning domains from Biology to Engineering, Economics to English and Entrepreneurship to Media. They currently spearhead the Purdue Polytechnic Institute's Transdisciplinary Studies in Technology program.

REFERENCES

- [1] Hart Research Associates, "It takes more than a major: Employer priorities for college learning and student success." Association of American Colleges & Universities Universities, Tech. Rep., 2013.
- [2] D. Price, *Open: How We'll Work, Live, and Learn in the Future*. Crux Publishing, London, UK, 2013.
- [3] T. Wagner, *Creating Innovators: The Making of Young People Who Will Change the World*. Scribner, 2012.
- [4] (2017). [Online]. Available: <https://sustainlo.calpoly.edu>
- [5] (2017, June). [Online]. Available: <http://ae3.engineering.illinois.edu/student-programs/ifoundry/>
- [6] (2017, June). [Online]. Available: <http://olin.edu>