Creativity, problem solving, soft skills, and communication-The Polytechnic Experience (Work in Progress)

Dr. Kevin Dietsche
University of Wisconsin-Stout

Abstract

Coursework at the University of Wisconsin-Stout within the Engineering and Technology Department routinely reinforce content covered in the classroom through lab related activities while working with business and industry partners. In an engineering and design class the industry partners have shifted to involve Kindergarteners, 1st graders, and 2nd graders, to leverage the natural creativity, problem-solving, and communication abilities of these age groups to foster growth in the post-secondary students along with focusing on user centered design. These elementary students were invited into the classroom as "clients" in which the post-secondary design for industry students employed a one-hour user-centered design process.

Description

"Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results." (Dewey, 1938). The University of Wisconsin-Stout is a comprehensive, career-focused polytechnic university which prides itself on its ability to deliver hands-on, minds on, lab-oriented instruction with the inclusion of outside partners. This methodology has strong ties to Dewey's experiential learning theory. The engineering and technology department delivers coursework(ETECH 205) involving objectives that include teaching the students to be creative, grow in problem solving ability, and to communicate effectively.

Through the objectives of *ETECH 205 Design for Industry* opportunity arose to develop a collaborative partnership with the City of Menomonie, UW-Stout, and a local elementary school. The instructor sought to utilize the dead/dying ash trees within the city as an opportunity to implement a high impact educational practice-collaborative assignments and projects- described by the American Association of Colleges and Universities (AAC&U) as "learning to work and solve problems in the company of others and sharpening one's own understanding by listening seriously to the insights of others, especially those with different backgrounds and life experiences" (AAC&U, 2024).

Ash trees that were donated by the city's Urban Forestry Board were harvested, kiln dried, and stored at UW-Stout to be utilized in the ETECH 205 course. Elementary students were then invited into the classroom as "clients" in which the post-secondary design for industry students employed a one-hour user centered design process adapted by the instructor from Stanford's D. School wallet exercise to work with the elementary students to design and develop a toy involving a feedback loop and redesign with the clients. The post-secondary students developed a low-fidelity prototype with the elementary students during their visit. After the initial meeting with the elementary students the post-secondary students developed a high-fidelity prototype which was then presented to the elementary students for feedback at a later date. Design for industry students then took the feedback to develop one final prototype to be presented to capstone instructors. Two toys were then selected based on manufacturability by the capstone instructors and given to two senior level capstone groups. The capstone groups are tasked with designing and building a manufacturing module that can then be taken to various places as an outreach tool to give the dead ash trees back to the community in the form of a toy.

Student perceptions are measured by a simple, end of semester survey. In this survey instrument, Likert style questions along with open ended questions are used to ask students what their perceived level of creativity, problem solving, soft skills, and communication ability is and as to the effectiveness of the methodology used within the toy design process used within the course was in these areas. This work intends to include results of the 1st of a two-semester sequence of data collection.

Dewey, J. (1986, September). Experience and education. In The educational forum (Vol. 50, No. 3, pp. 241-252). Taylor & Francis Group.2

High-Impact Practices. (n.d.). AAC&U. https://www.aacu.org/trending-topics/high-impact

High Impact Educational Practices.pdf (hcc.edu)

Kuh, G.D. 2008. High-impact educational practices: What they are, who has access to them, and why they matter. Washington, DC: Association of American Colleges and Universities.