Creativity, Problem-Solving, Soft Skills, and Communication: The Polytechnic Experience (Work in Progress).

Introduction

- The researcher utilized dead/dying ash trees from the City of Menomonie's Urban Forestry Board to develop toys in a product development course.
- Post-secondary students partnered with kindergarten and 1st grade students who acted as clients in which the post-secondary students designed toys for.
- Twenty-five students comprised of engineering technology, technology education, packaging engineering and business administration/entrepreneurship students are enrolled in the course simultaneously.
- Problem identification, solution generation, and processing material into prototypes are studied within the course.

Objective

- Investigate student perception of their experience in developing creativity, problem solving, soft-skills, and communication given Design Build curriculum that employs community-based learning, projects, and a collaborative assignment approach.

Methodology

- A modified Stanford Design School "wallet exercise" was developed utilizing Froebelian principals and best practices for reaching an audience of Kindergarten and 1st grade students.
- Undergraduate students were placed in groups, trained on how to communicate with their kindergarten and 1st grade clients, and employed the design build approach to identify problems, generate solutions, and process wood material into high fidelity prototypes.
- Experience based research employed students to fill out a Likert scale survey and answer open ended questions measuring perceived level of creativity, problem soling, soft skills, and communication ability and the effectiveness of the methodology developed within the toy design process.
- The survey was delivered at the conclusion of the toy design module.

Student Comments

- "I enjoyed having the time in class to suggest ideas to others as well as receive help from my peers."
- "I enjoyed making something for a 1st grader…it made me put a certain amount of care into what I was doing."
- "I found myself working harder to impress the first grader than I did on my normal class work."
- "I found myself trying to get inside the mind of a 1st grader and try to understand what they truly wanted."

Findings

n=22

- In relation to improving attributes related to ***Creativity***:
  -91% of respondents agreed or strongly agreed they improved their ability to produce numerous ideas
  -68% of respondents believed they grew in their ability to produce unusual or unique ideas
  -81% believed they were better at taking abstract ideas and being able to design and build realistic designs
- In relation to ***Problem Solving***:
  -86% of respondents felt they grew in their ability to problem solve effectively
- In relation to ***Soft Skills:***
  -50% of respondents felt their ability to have a positive attitude grew
  -55% of respondents believe the project grew their work ethic in a positive manner
  -64% of students felt they grew in their ability to collaborate with others effectively
- In relationship to ***Communication:***
  -77% of students felt they learned how to better communicate as a result of the toy building project

Conclusions/Recommendations

Conclusions:

Group brainstorming along with project-based work linked with a collaborative learning environment are important factors in giving students confidence and growth in their creativity, problem solving, soft skills, and communication abilities.

Increased sample size and study duration along with refined curriculum and hands on teacher training may aid continued and improved success in utilizing the Design Build Process in the post-secondary setting.

Recommendations:

Explore opportunities to teach creativity, problem solving, soft skills, and communication within a laboratory in a manner that solely utilizes project-based, problem-solving activities, group brainstorming techniques, and a simplified Design Build Process format while connecting to students to a younger generation.

Further utilize the Design Build process with similar instruction and project parameters, but utilize a retirement age group as the client.

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