Promoting Complex Learning with Team-Based, Problem-Centered Assignments in a Large Psychology Course

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Background

Overview: Two psychology faculty reorganize a large active and collaborative learning course around authentic, problem-centered learning.

PSYC 333: Child Development

- Upper division for majors and non-majors
- 210 students in two sections (90 and 120)
- Moved to active learning classroom (LEEP2)
- Progressive redesign efforts since 2010

Key Course Goals:

1. Develop evidence-based arguments about 5 principles in developmental science (DS) (e.g., Nature and nurture interact) about which students have frequent misconceptions
2. Apply knowledge of DS to solve pressing problems
3. Communicate principles/applications in writing

2016 Course Iteration:

- Pre-class reading quizzes
- Fixed learning teams using "catme" tool
- Class time organized around short team-based Engaged Learning Activities (ELAs)
- Students wrote integrative "case study" each unit
- Two-stage (individual and team) exams

Spring 2017 Modifications

2016 Challenge	2017 Solution
More support for student critical thinking- analysis and use of research to support claims	**Science Fridays (SciFri)** Students read journal article and discuss/analyze/apply in class
ELAs needed more structure and coherence	**Problem-Centered ELAs** Organized weekly ELAs around real-world or simulated problems and cases.
Unit-level assessments needed to be streamlined, more authentic	**Authentic Assessments** Unit assessments asked students to analyze authentic problems/cases, with individual and team products

Weekly Problem- or Case-Centered Learning (in class)

Example 1- A Child's Lot in Life

For 2 weeks of material on emotional development, attachment and self, teams draw cards describing a particular infant's early temperament and developmental context (parents, SES, social support, culture). Teams generate a child bio at age 17, explaining how and why their specific combination of child and context gave rise to the outcome.

Example 2- The Columbine Tragedy

Over 2 weeks of material on Peers, moral development and prosocial and antisocial behavior, students produce a "video skits" or a simulated news program posing as experts to analyze developmental influences on the actions of one of the shooters.

Example 3- THERE on Mars

To consider social and cultural influences on development, students are given an ad for a new planned community on Mars ("THERE"). Teams analyze policies, customs, systems etc. to decide whether it is a community they would want for their future child or grandchild, and why.

Special Advertising Section

THERE on Mars: Join the Adventure

EARTH INDEPENDENT

Has life on Earth got you down? Do you want to live in a peaceful place where equality is not just an ideal, but a reality? Check out our new community on the next human frontier: Mars. This Earth-independent human community on the Red Planet is just around the corner. We call it THERE. We have chosen the best ideas from many different human societies and have used them to design a community that promotes interpersonal harmony, equality, and human flourishing. Each community member will receive a 10-square-mile parcel of land that surrounds a home perfectly designed to protect them from the red planet elements. The collective work efforts of all community members will generate the food, water and energy needed to sustain life for all people on the planet. THERE will be a great place to raise a family, with many family-friendly policies, systems and structures. One-month old infants can spend their second month in a lovely nursery (staffed by teen interns!) while their parents rest and de-stress at an all-inclusive spa. Back at home in THERE, there is never a need for children to sleep alone, as all homes are designed with master bedrooms that have a nook for infant/child co-sleeping. THERE's family leave policies and equal compensation structure allow for six full months of parental leave. After that, there is no need for daycare, as all THERE homes also come with highly attentive robotic playpens that keep your child safe, well-fed and entertained until you return home from your long day at work. Elementary and secondary education are high priorities in THERE, with free public transportation to and from school, low teacher-child ratios, developmentally appropriate curricula, frequent recesses, and peer acceptance coaching. To maintain a fair system that treats all children and families equally, direct parent-teacher communication will be prohibited. There will be no digital divide in THERE, as all children will be provided electronic devices for internet and media access and communication. Reserve your spot in THERE today! Countdown to 2030!

Authentic Integrative Unit Assessments

Unit 2 Individual Assessment- The Fiint Water Crisis: Damaging Children

At the end of Unit 2 on Cognitive Development, students read a synopsis of the Flint water crisis and a research report on lead effects. A series of prompts asked them to analyze the potential effects of lead on multiple aspects of children's cognitive development

Unit 2 Team Assessment- Design an Intervention for Flint Children

Students wrote a proposal to the State of Michigan to fund an empirically-supported educational intervention to foster optimal developmental outcomes for the children of Flint. Teams "piloted" a sample intervention activity with other teams and used feedback to improve their plans.

Student Performance (so far)

Understanding of Developmental Science Principles

Students show improved explanation and application of widely-misunderstood DS ideas, even when applied to complex problems.

Figure 1. Pretest
% of Students Who Responded Correctly Questions about DS Principles

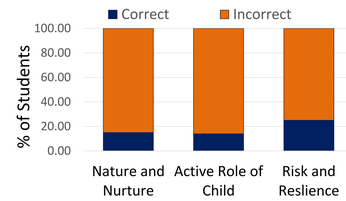
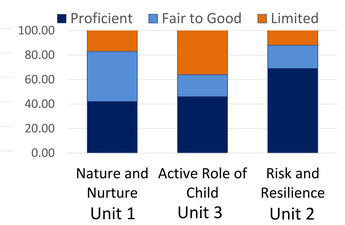


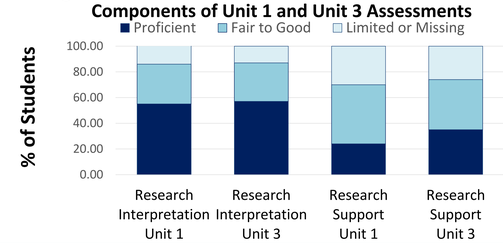
Figure 2. Post-Test:
% of Students Who Showed Competence on DS Principles in Unit Assessments



Critical Thinking: Interpreting and Using Research

- From Unit 1 to Unit 3 students showed small improvements in interpretation of research results and use of research support
- Use of Research support is a relative weakness that we are still targeting in Unit 4.

Figure 3. Distribution of Performance on Critical Thinking Components of Unit 1 and Unit 3 Assessments



Reflections and Future Directions

- Problem- and case-based learning can foster understanding of complex developmental science principles that are frequently misunderstood.
- Students show gains in use of research to support their problem solutions, but this area needs greater growth.
- Analyses of assessment dimensions aligned with different ELAs will enable us to identify the most effective ELAs.