



2016 HAWAII UNIVERSITY INTERNATIONAL CONFERENCES
SCIENCE, TECHNOLOGY, ENGINEERING, ART, MATH & EDUCATION JUNE 10 - 12, 2016
HAWAII PRINCE HOTEL WAIKIKI, HONOLULU

ETHNOGRAPHIES OF INTERDISCIPLINARITY

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Ethnographies of Interdisciplinarity

Synopsis:

Workshop participants will explore new methodologies for integrating S.T.E.A.M. pedagogy into their curricula through performing a series of exercises, which include explorations of meta-patterns, poetry, mathematics, and metaphor for the promotion of collaboration as emergent community.

There are many levels to this phrase “collaboration as emergent community,” which we hope to uncover, through an interdisciplinary study of ethnography, affect theory, and cognitive linguistics.

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There are many levels to this phrase “collaboration as emergent community,” which we hope to uncover, through an interdisciplinary study of ethnography, affect theory, and cognitive linguistics. This paper is a brief introduction to our continuing research, which comes out of our collaborations in teaching.

Short explanation of the class:

The workshop is based on our University of La Verne honors class *Invisible Theatre: Math and Metaphor on the Digital Stage*. This class teaches mathematics through collaborative exploration of metaphors. Some mathematical areas explored in the class were knot theory, hyperbolic geometry, topology, and the concept of the number zero. Each group had to produce a tangible example of a connection between a mathematical principle and the underlying metaphors that created a deeper understanding of the math being used. Fabricating this tangible demonstration demanded that the students use shop tools typically available to the theatre scene shop. With varying exposure to fabrication skills, some students met the challenge of producing their final object easily, while others did not. Even more challenging for some was the conceptual development of the connection between the metaphor and math as demonstrated in the group project’s tangible outcome. The following exercises are inspired by the class to promote creative thinking and invention, idea generation, pattern recognition across different levels of observation, use of heuristics, prototyping, engineering, and fabrication. All of which are important means to integrate S.T.E.A.M. topics into the curriculum.

Example Exercises:

Meta-patterns:

Metapattern can be thought of as the “transference of pattern from the physical or biological realm to the more abstract realm of concepts...” (Volk, Bloom, and Richards, 2007, p.1074)

Exercise 1. Using the metapatterns deck select two cards. Read the subject heading on the front. Think of as many examples as you can. Repeat the same steps with the second card. Write a list of qualities or purposes for each example. Now come up with as many examples as you can by combining two patterns. Example: Spheres and Tubes = Nest, or Geodesic Dome, or Cotton Ball, or Lint, or Neural Net, etc. Pick two combinations and make a list of their blended qualities or purposes. Example Sphere: container + Tube : transfer = closed network.

Metaphor:

Exercise 2. Think of five metaphors and write them down. Pass your paper to your neighbor. Using the examples given to you, take your favorite metaphor and invent a set of gestures that communicates the feeling of the metaphor. Explain how the gestures/symbols convey the meaning in your group. Write down any insights into the meaning of the metaphor you may discover through both the performing of the gesture and the seeing of the gesture.

Language in design:

Exercise 3. Think of as many prepositions as you can and assign them relative values. For instance *above* is greater in height than and *below*, but *below* is greater in depth than *above*. *Inside* is closer to the center than *outside* but *outside* is farther to reach than *inside*. Following this reasoning within a rectangle, draw a shape representing the king in the greatest (or least) place of power. Draw shapes representing the royal subjects somewhere on the page that is in relation to the king and explain what the reasoning is behind the particular placement. Next think of buildings where power relationships are enforced. Write down their common features.

Brief results:

A resulting paper by co-teachers reports higher scores in post-class survey results occurring when students were asked about risk-taking in math, general importance of math, and confidence with math. (Authors, in press) Building on this idea of risk-taking, confidence, and learning effectiveness, we would like to further research the use of affect theory (see below) to contextualize the social dynamic at work among the students in their collaborative class projects to make the case for collaboration as emergent community.

Area of future research:

Metaphor

Invisible Theatre: Math and Metaphor on the Digital Stage introduced concepts in the two disciplines of stagecraft and math to promote the use of both metaphor and making as integrative learning approaches. In this particular recipe for interdisciplinary pedagogy, the primary tool for making connections between two disciplines is metaphor. Can metaphor be thought of as a conceptual tool for guiding inclusivity? If we take the approach that “one thing is like another thing,” is the message of metaphor that it maps likeness instead of parsing out differences? What is the connection between successful collaboration and models that promote inclusivity? How can this social dynamic in micro-collaboration be applied to theories of larger community such as social capital?

To answer these questions, we would like to apply the use of affect theory as a framework to examine the dynamics of group projects to determine how individuals operate with either positive or negative affect during collaboration, and to better understand how specific affect can mark success or failure in achieving a common goal. (Lawler, 2001) “Affects make up the relations within the temporary worlds we are constantly creating, and by which we are constantly being created. Affect involves the moment to moment question of being in the world, in all its constant change.” (Murphie, 2010)

The research methodology we intend to use to study classroom work is ethnography: gathering data through observation and field study, oral histories, and interviews extending the idea of the student-centered approach by looking at the student project groups as the locus of knowledge production.

Conclusion

The purposes of the workshop are to introduce the some exercises inspired by the course *Math and Metaphor*; explore new methodologies for integrating S.T.E.A.M. pedagogy into the curricula; to suggest novel approaches to teaching in an interdisciplinary, integrative-learning setting; to test the connections between positive experience and successful collaboration; and to ask the question: “How can this collaborative social dynamic be applied to theories of larger community such as social capital?”

Integration of metaphor in learning may reinforce ideas about community. By applying affect theory to create a model of group interaction and looking for the possible correlations in our classes between the success of group projects and the frequency of positive group interactions during the process, we are studying how students grow and learn through the projects, questioning the students’ interpersonal struggles in terms of negative and positive outcomes, and how those outcomes result in shared understanding, empathy, and intersubjectivity. This investigation focuses on a given classroom community. Rather than making sweeping generalizations about the state of education we will limit our study to the special case of the classroom with the hope of inspiring other teachers to promote interdisciplinary learning through similar means and consider connections to community.

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