Rolling the Dice on a Game of Cards

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Vexation

I have recently defended my dissertation and have taken a position at Chico State as an assistant professor. The dissertation has uncovered some insights that I believe would be informative regarding culturally responsive science teaching. My study of African American young men attending an inner city school focused upon the reasoning that guides their decision-making in an everyday cultural practice: a card game called Spades. Even though my research has reinforced that these young men possess funds of knowledge that could enhance their learning, the study did not focus upon science concepts per se making the link between scientific reasoning and everyday practice problematic. Consequently, I am looking for input about how to bridge those two realms: the academic world versus the lived experiences of African American young men. So that the reader can provide informed input, the focus of the first section of the paper is to summarize the central findings from my dissertation and to highlight the problematic nature of relating my findings to classroom practice. In the second section, I propose a venture in the form of a university level course to be taught at Chico State.

The research question guiding my dissertation was as follows: What kinds of models or model-based reasoning are learned and developed by African American young men playing the culturally valued game of Spades[1]? I asked this question in order to provide a lens that might facilitate making connections between what the players learn through the practice of Spades, and what scientists do when they engage in modeling, a practice central science. The underlying purpose of the study was to gain insight into how we might improve educational settings for African American young men, as they currently occupy the lowest levels of achievement in science education.

In the exploration of the research question, the study highlighted a number of central findings. Through the diachronic analysis (i.e., taking place over time), I found that Bid Whist and Spades are common cultural practices in African American communities which taken together date back nearly 150 years. Players have changed the game of Spades over the past 70 years, and the players at the high school where I conducted my study continue that dynamic history by creating and changing a game that they now call New School Spades. They continually change the game in order to keep it enjoyable and to maintain a competitive edge over their competitors for the purpose of maintaining status and respect in their peer-based community.

Through the synchronic analysis (i.e., taking place during single events), I found that expert players have developed an ethic of conservation to consistently win tricks with the lowest possible card. To do so, the expert players use a number of resources including the ability to strategically and simultaneously talk, count cards, selectively memorize cards played, assess risk, bluff, read partners as well as opponents, estimate probabilities, and predict outcomes. By using their resources the expert players win games consistently, even when they may not have been dealt the best hands. As a result, they maintain their status as the best players in the Spades playing community at the high school.

Finally, I found that Spades players use a number of forms of cognition that relate to modeling and model-based reasoning. In short, the players consider multiple variables, as well as their mathematical relationships, to predict future occurrences and then play cards accordingly. Estimating the effects of a change in a variable on the probability of an occurrence is salient. As the game of Spades is dynamic, the players operate from different models depending upon the situation. Such models include ones for bidding, leading, and playing from second, third and fourth positions.

The findings from the play-by-play analysis demonstrate interesting connections to scientific modeling. For instance, conceptual models from any given field of science that attempt to represent and make sense of complex systems or phenomena deal with multiple variables in a system and their relationships, often described in mathematical terms. Such reasoning is also germane to playing Spades, as the players consider multiple variables and their relationships when making decisions. Further, modelers always deal with high degrees of uncertainty as the systems being modeled are often complex and the data collected are often incomplete. Scientists call these fuzzy models, as the observations and data only allow for scientists to use data and predict outcomes in terms of ranges and likelihoods. Spades players use similar forms of reasoning, as they make decisions based upon only seeing a small part of a larger picture: their own hand and any cards played by their teammate and opponents. They use these observations, along with a general knowledge of probability, to make predictions and play cards accordingly. Lastly, all modeling uses conditional probability: the likelihood of any future occurrence is always dependent upon specific conditions and inputs. Again, the Spades players are highly

[1] See http://en.wikipedia.org/wiki/Spades for a description of the game.

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skilled at assessing situations, estimating the likelihood of future occurrences based upon their observations, and making decisions accordingly. In all of these ways then, the resources that Spades players have learned and developed relate in significant ways to the scientific practice of modeling.

The vexing part of my study resides in its implications for science teaching practice. What does a science teacher, who works with African American youth, do with this information in order to improve their classrooms for this traditionally underserved population? As with any study that draws from cultural practice in out-of-classroom settings, transferring the research findings into the classroom is loaded with issues. The knee-jerk reaction is to play Spades in class, help students realize the significance of the kinds of cognition they are using, and use this as a basis for engagement in scientific practices like modeling. Such a move is problematic for two reasons. First, it risks colonizing the practice: changing the practice, changing its context and purpose, and in the process, alienating those from the game who have traditionally engaged in it. Second, although Spades and Bid Whist are common games in African American communities across the United States, a large percentage of students from these communities do not play Spades. Consequently, what does one do with this study? How can the findings be put to work in concrete ways to improve science education for African American youth?

Venture

Given the challenge of relating the findings of the Spades study directly into classroom practice, I am proposing a venture that focuses upon preservice and inservice teacher education. Specifically, I am proposing designing a course in secondary science pedagogy to be taught at Chico State to either undergraduate preservice teachers, or to inservice teachers at the master's level.

The course would involve two themes central to the Spades study. The first theme would focus upon research on African American youth (as well as other youth from non-dominant groups) and the resources they learn through cultural practice. Using deficit notions of these students and their communities as a foil, this section of the course would examine current research from a number of scholars that takes an asset-based or resource-rich view of students from non-dominant groups. During this section of the course, the teachers would challenge their own deficit views of students and be encouraged to appropriate asset-based perspectives based upon critical readings of research, classroom discussions, and their own writing.

The second theme of the course would involve pedagogical interventions designed to open up classrooms to student resources in the service of disciplinary learning in science. This part of the course would foreground a modeling perspective drawing heavily from researchers in both science and mathematics education. The students would examine these practices by reading reports of empirically based research interventions, some of which focus on schools in high needs areas. The final project for the course would be to incorporate what they have learned from both parts of the course into the design of an innovative unit. Choosing one of the pedagogical interventions covered in the second part of the course as a foundation, the teachers would create a unit that incorporates modeling in a way that draws upon student resources in significant ways. To maintain relevancy of the end product, the students would be challenged to design a unit that not only meets the objectives of the course, but is also aligned with state and national standards for science education.

I have many questions for my peers in science education about this venture. Is this a good first step for building upon my dissertation? Does this course sound doable? What about the course might I research, given that Chico State is an R2 university where teaching is the focus, but research is required for tenure? What are my chances of getting a course like this passed through the department? Might the course encourage change and innovation in science teaching practice that would benefit students from non-dominant groups?