Cultural Toolkits in the Urban Physics Learning Community

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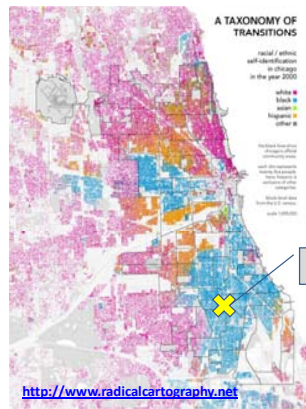
Demographics of CSU

45% part time
72% female
81% receive financial aid

85% Black, 7% Hispanic,
3% White, and 5% other

Freshman graduation rate is about 20%
Transfer graduation rate is about 45%

Our students tend to
be older,
(over 50% of the students over 25)
work full time jobs,
have and support families.

A TAXONOMY OF TRANSITIONS

CSU

http://www.radicalcartography.net

Homogeneity as a cultural resource: The homogeneity of CSU classroom empowers students to build on and share common cultural resources in science learning.

Culture as a Toolkit

This toolkit contains: symbols, stories, rituals, and world-views, which people may use in varying configurations to solve different kinds of problems. "Culture … is more like a set of skills and habits than a set of preferences or wants" (Swidler, 1986).

Often we find that our students have not acquired certain values that we promote in the physics course. Evidence for this comes from nationwide results on Attitude and Expectations Surveys like the MPEX and CLASS (Redish, 1998 and Adams et. al., 2006).

Interpreting this:
Our students don't value the same things we do.
or
it is difficult to pursue these values when "accepted skills, style, and informal know how are unfamiliar." Students will pursue values for which they already have the cultural equipment (Swidler, 1986).

Utilize the existing Cultural Toolkit:
"People do not readily take advantage of new structural opportunities which would require them to abandon established ways of life … because they are reluctant to abandon familiar strategies of action." (Swidler, 1986)

Create Hybrid Identities and Cultures:
From a sociocultural constructivist perspective students 'come to know' by combining their ways of talking and doing … with the new science ways … (Elemsky and Seiler, 2007)

Thus, instructors should encourage students to
- **use their existing strategies of action in exploration of science content and practices,**
- **create hybrid identities rather than assuming accepted science cultural practices.**

When you give students creative space and emphasize certain pieces of the cultural toolkit you can develop a sense of loyalty and solidarity among the participants and create resonances in the classroom.
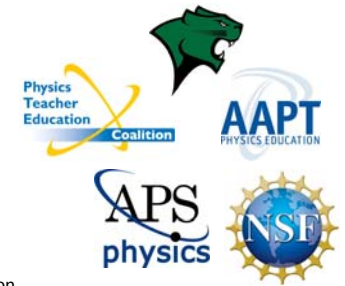
Bringing culture into early teaching experiences: Examples from CSU's *PhysTEC* and *Noyce* Physics Majors

*Liberal Arts Option
CSU PhysTEC Fellow, 2012*

High School Lesson on Energy at Perspectives Calumet HS

Interviewer: I was kind of interested in talking to you about what you did for your lesson in the high school. And I was...interested in kind of the ice breaker activity that you tried out.

The ice-breaker game actually came from me watching my boss in theater. I work with sounds, switchboards, for musicals … and … he try to get all the actors' and casts' energy up. And they play a game where you point at someone and you make a noise, like, "Zip." And that person was ... point to someone else and make another noise like, "Zap." And what that does is go around in a circle; and then you speed it up. And then whoever mess up: they have to step out ... get your energy going.
… I remember in high school you come in, you have a seat, take out your laptops, and you start going to work right away. There's no interacting fun. There's no, I might have had a bad class period before I came in this class. I need to change that energy to make it positive.
… (when) we went over the questions … I allowed the students to choose which question they wanted to answer by raising their hand …They also had to give their meaning of where they thought the most energy was: elastic potential energy, gravitational potential energy, or kinetic energy … they was able to zip it or zap someone else …. So that was a good way for students to interact with each other, so they won't feel like, "I got one part and I got the other part wrong, just because I couldn't express that correct answer."

*Secondary Ed. Option
CSU Noyce Scholar,
2008 - current*

Middle School Lesson on Density w/ Ashburn School

Interviewer: When you were teaching a lesson for the middle school group we had last year, you did this clapping thing …

… I did that right there on the spot … Yeah. I just, I just up and prayed it worked … Um, well they were getting noisy. And I wasn't getting their attention. So I, I feel like a clap you can hear that. But if you're doing a loud clap and if you're, um. It's almost like a call and response type thing. … So, if I feel like I don't have your attention, you know, I'm gonna clap. And, you're gonna clap, saying, 'Ok, I got you.' … And then I say, "Ok, let's stop." Then we all stop together. Then I know you're, we're together. … So, this is my call [claps] … I mean, I guess it comes from church. I don't know where it comes from. I didn't look for the origin. I just, that's just what...I can think of it as. … I need your attention. And then they're gonna go clap, you know, 'Okay, oh, she needs our attention.'

Thanks to Kenneth Barnes for interview transcriptions.

Call and response "is a is a type of interaction between speaker and listener(s) in which the statements ("calls") are emphasized by expressions ("responses") from the listener(s), in which responses can be solicited or spontaneous, and in which either the calls or responses can be expressed linguistically, musically, verbally, non-verbally, or through dance." (Foster, 2002). It is popular in African American culture and is often used for democratic participation (Smitherman, 1977; Foster, 2001)

Evidence of pieces of a cultural toolkit

Using a call and response mode of discussion
"I'm gonna clap. And, you're gonna clap, saying, 'Ok, I got you.'"

Focus on community rather than the individual
"we're together", "a good way for students to interact with each"

Attention on the individuals role in the support of the group
"they was able to zip it or zap someone else", "she needs our attention"

Building a positive energy
"get your energy going", "a clap you can hear that … a loud clap"