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Funds of Knowledge: Teaching Minority Youths for Empowerment

My Vexation

My research focus has been understanding issues related to teachers, students, and parents who come from minority, immigrant, and urban families. In my research I argue the need for science teachers and teacher educators to understand and implement actions that promote science learning in students from poor minority families. I have always believed that science education has to be inclusive, empowering, and socially just. In this regard I also look at how teachers, students, and parents from diverse social and cultural backgrounds interact and work towards making science relevant and worthwhile for the betterment of the communities they represent. As educators and researchers, our underlying common goal has been advocating science teaching and learning as an act of empowering the learners – minority students in particular.

The present evidence suggests that some minority communities successfully support their youths to succeed in science but others struggle to do so. The research also points out that low-income minority students are more likely to be taught by poorly prepared science teachers, and attend badly managed schools that lack critical resources. However, minority students bring to the schools rich and diverse personal funds of knowledge that are produced through culturally, historically, and intellectually rich life experiences. In many instances teachers fail to support students' funds of knowledge as an integral part of meaningful science teaching and learning. To better prepare our teachers and ourselves as educators, we need to understand the resources and strategies minority students utilize while constructing science knowledge.

We have seen the impact of parents' and teachers' funds of knowledge and how those get utilized in classrooms. However, we have not understood how students develop and utilize their funds of knowledge in the active learning environments of the classrooms.

When I work with pre-service and in-service elementary and secondary science teachers, I am surprised, as well as challenged, to hear from our teachers that, "In every class we hear about using students' prior knowledge (socially and culturally constructed knowledge) but we don't see why that is important." I have even been told by some of the teachers that, "We [who advocate for social and cultural knowledge as a part of science learning] are telling them [teachers] to learn more about cultural stuff than science." At the same time I feel elated when the same teachers talk about how important it is to know social and cultural differences between White students and Non-White students to effectively teach all the subjects, including science. I see this dichotomy presenting us with an opportunity to document how and for what purposes do these teachers change and what does the trajectory for change look like.

I always wondered how minority students utilize their funds of knowledge in learning science. What kinds of funds of knowledge do minority students create in science classes as they interact with their peers? How are peer created funds of knowledge different from the funds of knowledge created through social, cultural, and historical experiences in homes? If the goal of teaching science is to empower our youths, then we need to challenge the status quo that advocates science teaching and learning a culturally neutral task. In my works I always challenge pre-service and in-service teachers, students, and parents to think about learning science as an extension of everyday social interactions. Therefore, teachers need to tap into minority students' funds of knowledge as an extension of culturally responsive pedagogy.

For teachers who have had fewer opportunities to interact with individuals from minority groups, the worth of funds of knowledge in science may be too vague and demanding. I wonder if these teachers even want to hold this kind of pedagogical idea useful? What about school administrators who have greater leverage in what teachers can do in the classrooms? Does the high-stakes test help teachers to

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work with students' funds of knowledge? I question if our teachers believe in teaching and learning science as an empowering act? The biggest challenge of all is: What tensions do teachers have to negotiate in enacting this kind of science instructions? Therefore, if teachers are to teach science for empowerment and social justice, how will students' funds of knowledge be strategically and purposefully utilized to achieve those goals?

My Venture

In my attempt to understand how and for what purposes should teachers utilize students' funds of knowledge in science classrooms, I wonder if the teachers, who are my partners in teaching, learning, and research, understand why they should care for these funds of knowledge. My work with minority students, teachers, and parents from immigrant families are dotted with rich and complex funds of knowledge. Students from these families utilize their funds of knowledge to understand and make sense of what they learn at school. For example, a sixth grade Hmong student told his teacher that *appeasing the spirit* and *wearing a talisman* made up of herbs would cure the disease. The idea of bacteria and virus causing disease did not have any *rational explanation* for him. Similarly, taking medicine to cure illnesses was *beyond his imagination*. Teachers and educators encounter these instances all the time in our schools.

In my research with Hmong students, parents, and teachers and my science education courses I question if our teachers believe in teaching and learning science as an empowering act? What would make science learning empowering to minority students? What are science teachers' personal and professional beliefs about diversity and how these beliefs interact with students' funds of knowledge? I wonder if the first step in all of this is much more mundane than getting our teachers to understand "funds of knowledge" and the wealth of diversity in their classrooms. Is there a way to push teaching from a rather inert distribution of knowledge (which may already be culturally biased) to an active empowerment of students as citizens?

Finally, I am interested in getting feedback and suggestions from Crossroads participants related to my questions and dilemmas.