Describing Students' Talk about Physical Science Phenomena outside and Inside the Classroom: A Case of Secondary School Students From Maragoli, Western Region Of Kenya

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Abstract

Because of cultural and linguistic influences on science learning involving students from diverse cultural and linguistic backgrounds, calls have been made for teachers to enact teaching that is sensitive to these students' backgrounds. However, most of the research involving such students has tended to focus on students at elementary grade levels from predominantly two linguistic backgrounds, Hispanic and Haitian Creole, learning science concepts mainly in the life sciences. Also, most of the studies examined classroom interactions between teachers and the students and among students. Not much attention had been paid to how students talk about ideas inherent in scientific phenomena in an outside-the-classroom context and much less on how that talk relates to that of the classroom. Thus, this research extends knowledge in the area of science learning involving students learning science in a language other than their first language to include students from a language background other than Hispanic and Haitian Creole at not only the high school level but also their learning of ideas in a content area other than the life science (i.e., the physical sciences). More importantly, this research extends knowledge in the area by relating science learning outside and inside the classroom. This dissertation describes this exploratory research project that adopted a case study strategy. The research involved seven Form Two (tenth grade) students (three boys and four girls) from one public, mixed gender day secondary school in rural Kenya. I collected data from the students through focus group discussions as they engaged in talking about ideas inherent in selected physical science phenomena and activities they encountered in their everyday lives, as well as learned about in their science classrooms. I supplemented these data with data from oneon-one semi-structured interviews with two teachers (one for chemistry and one for physics) on their teaching of ideas investigated in this research, the secondary school syllabus (KIE, 2002) as well as the students' responses to questions on teacher-made assessments involving the ideas investigated. Three main findings emerged through this research. The findings are: (1) the students adopted everyday ways of making sense of the world (i.e., everyday language and everyday observations) in talking about ideas investigated both outside- and inside-the-classroom contexts, (2) cultural knowledge emerged from the student's talk related to the nature and form of lightning different from that emphasized in science, and (3) students who may initially seem uninterested in participating in discussions involving science ideas showed possibilities for participation in such discussions. Drawing on the work of scholars such as Aikenhead (2001), Ballenger (1997), Brock-Utne (2007), Herbel-Eisenmann (2002) and Warren et al. (2001), I argue that students' everyday ways of makings sense of the world are rich starting points from which to leverage students towards meaningful learning in science. However, this may happen only if instructional materials such as the syllabus

are explicit in not only giving examples of phenomena and students' experiences with them in outside the classroom contexts, but also acknowledging that possibilities exist for cultural understanding and talk about ideas inherent in the phenomena involving ideas students learn about in their science classrooms.

Keywords: Physical Science, Phenomena, outside and Inside the Classroom, Secondary School Students, Maragoli, Western Region, Kenya