

Introduction

- Classrooms are small communities that we build with communication (Kelly, 2007).
- In science classrooms specifically, scientific language is used to observe, hypothesize, predict, compare, describe, question, analyze, lecture, and so forth (Lemke, 1990).
- Students acquire scientific information mainly from teacher talk or teacher and students interactions in a classroom setting.
- Teacher questioning is an obvious characteristic of classroom discourse (Chen, 2007).
- The National Research Council [NRC] (2012) cites asking questions as one of the eight practices that are crucial to the K-12 science and engineering curriculum.

Purpose

The purpose of the study will be to find out how a high school biology teacher;

a. uses spoken classroom discourse and specifically questioning when they teach evolution versus another non-controversial topic
b. uses questioning to engage students in thinking that stimulates their construction of knowledge.

Research Questions

1. What kinds of spoken discourse patterns does a high school biology teacher use to engage students in evolution and human genetics units?
2. What ways of questioning does the teacher use in these two units?
3. What factors do influence the teacher’s questions and ways of engaging students?

Literature Review

Why Evolution?

- Many scientific and educational organizations acknowledge the importance of evolution as a unifying theme in biology (NRC, 2011).
- According to Rutledge and Warden (2000), it is the strongest theory in biology.
- Even more strongly, Dobzhansky (1973) stated, “nothing in biology makes sense except in light of evolution” (p. 125).

Exploring the Factors Related to Teaching Evolution

- Teachers’ religious orientations have been found to affect their understanding of evolution (Rutledge & Warden, 2000).
- Teachers’ views of NOS will be correlated to their understanding of the nature of science (NOS) have been found to affect their understanding of evolution (Rutledge & Mitchell, 2002).

Classroom Discourse Patterns

- In constructivist-based instruction, the teacher initiates dialogue mostly to elicit students’ understanding in a non-evaluative manner.
- In traditional teaching, the classroom discourse typically starts with the teacher’s question and ends with the teacher’s evaluation of the student’s response.

Figure 1: The Sequential Organization of a Typical Three Part Structure (Mehan, 1979).

Methodology

Research Questions

- What types of spoken discourse patterns does the teacher use to engage students in evolution and human genetics units?
- What factors do influence the teacher’s questions and ways of engaging students?

Data Sources

- Classroom observations and Video recordings of lessons
- Acceptance of Evolution
- Questionnaire: GAENE 2.0
- Understanding of Evolution
- Questionnaire
- Semi-Structured Interviews

Data Analysis

- Lemke’s (1990) categories of discourse patterns and Carlsen’s (1991) sociolinguistics framework of teacher questions will be used to analyze the types of classroom discourse and teacher questions.
- The higher the value, the more strongly the respondent accepts evolution (Smith, 2011).
- Cumulative scores of correct responses will determine teacher’s understanding of evolution (Rutledge & Warden, 2000).

Contact Information

Email: bavsar@indiana.edu