

Geographic Information Systems (GIS) in Education: Students as learners and leaders

Educators are experts in content area knowledge and learning pedagogy whereas students are experts in using computer technologies. How do we take advantage of these combined strengths when designing GIS (Geographic Information Systems) curricula and projects? This paper will investigate the issues surrounding students as learners as well as leaders and teachers of GIS technology. Findings from a qualitative study of middle school students who are GIS learners and leaders will be presented.

The “traditional” characteristics of the teacher student relationship in the classroom include: content area knowledge held by the teacher, the teacher is the leader in the classroom, and the transmission of knowledge from teacher to student is what Friere referred to as the “banking theory of education”. In this model of education knowledge and facts are deposited in the student and withdrawn in often very meaningless ways for the learner. In the technology rich classroom found in this study the role of the educator is based in constructivism. The teacher is a consultant and facilitator. The students found in this classroom aid in the co-construction of curricular goals and projects.

Geographic information systems (GIS) is a technology that allows the user to create and publish maps. In addition GIS facilitates analysis of spatial aspects of data. At the core of the GIS is a georeference, or a tie to a specific location this is coupled with a database of attributes tied to the georeferences. According to several middle school students “all things are mappable.” (Grice, 2003; Denning, 2003)

The setting of this study is in an urban magnet middle school in North Carolina. The GIS educator is a language arts teacher with 15 years experience in public education. In addition, this middle school educator is a co-instructor in a GIS in Education course at NC State University. The students in this study are all Caucasian males. The students completed at least two levels of elective GIS courses offered in the school.

The students of this study also participated in in-service teacher training as assistants to the trainer. These student GIS experts also participated as assistants in teaching GIS to students. They also began to develop GIS curriculum for teachers in the school. According to their teacher often students respond better to peers teaching new technology. Interestingly, there was a mixed response among the educators to the student assistants. Some educators are happy to see the comfort level of students with the technology. Other teachers are reluctant to show discomfort with new technology. Most though were encouraged by the enthusiasm displayed by the students. This paper will discuss what must be in place to make possible this shifting role of students and educators.

This qualitative study will examine the issues of students as learners of the technologies and as teachers of GIS. The use of videotaped observations in the GIS classroom and workshops as well as brief interviews are data sources. Observations of and by the students will facilitate further understanding of the ever-changing role of students not only as technology users and learners but also as technology teachers and experts.

The research to-date in the GIS field has previously focused on student achievement, efficacy issues and evaluation of GIS teacher pedagogy. There is a need for research grounded in multiple perspectives – student’s voices should be heard. Using an approach focused on student’s facilitation of learning and understanding of GIS technology a long-term sustainable program can be developed in a middle school. Educators must understand and become comfortable with the role as a guide and facilitator of students as learners and teachers of technology. Students also must shift their perspectives regarding their role within the school and their own education. How do middle schools, middle school faculty and staff, and instructional technologists assist in these new roles?

References

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