Wiki Interaction Tracks in Geometry Learning

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ABSTRACT

The constant comparative method (Lincoln & Guba, 1985) was used to analyze preservice teachers’ discussions and interactions in wiki discussion sections regarding geometric lessons that were written by other preservice teachers in the year before. The data was compared for the following interaction aspects of knowledge building: dialogical actions, participants’ roles, and discussion tracks. Research shows that building their content and pedagogic content knowledge, the preservice teachers together with the lecturer used mainly proposing, asking, requesting, arguing, presenting, and moving the discussion forward as dialogical actions. Proposing and asking were used for various goals such as proposing various ideas and actions, and asking about different issues concerned with geometric content and pedagogic content knowledge. The lecturer asked questions more than the preservice teachers, while the preservice teachers proposed more than the lecturer. The knowledge building was collaborative in nature, and one important aspect which enabled the collaboration is the topology of the wiki discussion section. This topology enables presenting the content of the messages; not just the titles, where the contents are presented as having the same level and thus the same importance.

Keywords: Geometry Lessons, Knowledge Building, Mathematics Lessons, Preservice Teachers, Tracks, Web 2.0, Wiki

INTRODUCTION

Wikis are used and constructed by students for various targets. Taylor (2006) describes the advantages that wikis offer: (1) it is available 24 hours a day (2) it is easy to navigate, easy to be searched and easy to make contributions to (3) Changes, new information and successful improvisations can be quickly documented, and (4) new, revised or alternative worksheets can be attached for subsequent use by anyone. Grant (2006) says that “Wikis have been heralded as one of a number of new and powerful forms of software capable of supporting a range of collaborative ventures and learning activities.” Forte and Brukman (2007) say that wikis can be used by students not just as a kit for writing to learn, but a kit for public knowledge building in schools. Head and Eisenberg (2009) found that higher education students use Wikipedia as a unique and indispensible research source for conducting their researches. They add that this collaborative, community-based online source gave students a big picture and language contexts for their research projects. Head and Eisenberg (ibid) report that in 8 out of 11 of the student discussion sessions there was a strong consensus among students that their research process began with Wikipedia.

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The wiki technology then serves various educational functions for teachers and students. So, preservice teachers would benefit from being introduced to this technology.

**LITERATURE REVIEW**

**Wikis in Education**

Tonkin (2005) identifies four categories of the wiki use in the education field:

1. **Single-user**: This use allows individual students to write and edit their own thoughts. So, it’s useful for revision and monitoring changes in understanding over a period of time.

2. **Lab book**: This use enables students to peer review notes kept online by adding commentary, annotations or other additions to existing lecture notes, seminar discussions, lesson plans, etc.

3. **Collaborative writing**: This use can be used by a team for joint project or research such as a group initiative, essay or presentation.

4. **Knowledge base**: Through collaborative entries, students can create course content that supplements and extends delivered material.

**Challenges to Wiki’s Use in Education**

Reynard (2009) points at three challenges to wiki use in instruction. The first challenge is to create meaningful assignment to motivate students’ learning. Reynard suggests that this can be done through: building a dynamic and not static assignment, the assignment should demand every student fully participating, and the assignment should use students’ participation to move their learning forward. The second challenge involves grading the students’ work in the wiki environment. Reynard (2009) says that students should be graded for all their work’s stages in the wiki environment, where the grading should take into consideration the following stages: working with and building on existing information, inputting new information, and synthesis of information into useful ideas for the project or work at hand. The third challenge to wiki use in instruction is the kind of collective knowledge requested in the assignments. Assignments should involve complex problems which don’t have obvious or preset solutions, and students should have adequate time for carrying out these assignments collectively.

Leuf and Cunningham (2001) suggest that wikis can support the delivery of class curriculum and projects, as well as the discussion during the process of creating and sharing knowledge. Raman, Rayn, and Olfman (2005) examined the use of wikis in facilitating the creation of a knowledge management system. They chose the wiki technology for its following characteristics: (1) Wiki technology is easy to install (and free), (2) Wiki technology provides capability for easy access and editing, (3) Wiki technology allows a class to develop a knowledge base readily, and (4) Wiki technology can aid knowledge creation and sharing in both corporate and academic settings.” Raman, Rayn, and Olfman (ibid) found that the students lacked initiative and the enthusiasm to discover for themselves how best to maximize the value potential of wiki technology. Furthermore, they concluded that effective implementation and use of a wiki to support knowledge management for effective teaching and learning is contingent upon familiarity of both students and instructors with the technology, level of planning involved prior to system implementation and use in class, class size, and the ability to motivate students to learn from one another based on the principles of discovery learning.

**Effectiveness of Wikis as Learning Environments**

Coutinho and Bottentuit Junior (2007) describe a collaborative learning experience of post graduate students who attended a program on research methods in education, where the experience involved the use of wikis in advanced collaboration. They point that the feedback
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