Beyond the Term Paper: Exploring the Environment

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Exploring the Environment (ETE) uses a problem-based learning approach to help students investigate important social problems using remote-sensing images. ETE presents fourteen modules (which were accessed by over 150,000 users in 1997) through the Internet site at http://www.cotf.edu/ete/. For example, students can investigate problems of deforestation in the Amazon rainforests, logging in the Pacific Northwest, or the preservation of gorillas in Rowanda. Within each of the modules students are presented with a problem scenario, background information, and a set of remote-sensing activities. In addition, students are provided with a list of Internet resources related to the problem.

The ETE help section provides students with an activity structure for engaging in problem-based learning. Table 1 indicates how this activity structure relates to the theoretical framework. In defining the problem, students read and analyze the problem scenario, develop theories, list both what is known and unknown about the problem, and develop a problem statement. In developing solution strategies, students list what questions they need to answer in order to investigate the problem and list possible actions for acquiring the information. In solving the problem, students must analyze the information they find to determine how it is relevant to the problem solution. Students cycle through redefining the problem, developing solution strategies, and solving the problem until they are satisfied with the solution or they run out of time. The ETE teachers use a variety of approaches for having students share their results. Some have students do class presentations, while others have students engage in debates. One group of teachers engaged in parallel problem solving over the Internet for a period of five weeks.

This paper will focus on how students adapt their understanding of the term paper activity structure to the problem-based learning approach. The data for this paper comes from case studies of high school students who completed ETE modules during in-class exercises during the past three school years, and from student working with ETE summer workshops. The results indicate that students are adept at applying their understanding of the term paper activity structure to ETE modules. They read through the background information provided by the modules and search the Internet to find other relevant information. The students take notes and compile the information into a report. The key difference between a term paper and problem-based inquiry is that the latter requires students to formulate opinions and deliver recommended solutions to a problem. While most students provide a resolution in their reports, the resolution is rarely based on the information they collected but rather on their preconceptions about the problem. A key role for the teachers is to encourage students to analyse the information objectively and *then* form an opinion. Students must realize that the problem-based learning activity requires more analysis than a term paper activity.