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Children's literature and environmental issues: Heart over mind?

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ABSTRACT

This article describes a project conducted by a classroom teacher to examine the effects of children's literature on students' existing attitudes and beliefs toward environmental issues. Using *There's an Owl in the Shower* by Jean Craighead George as an organizer, two sixth grade classes reexamined their existing beliefs about endangered species. The purpose of using the book as part of the instructional strategy was not to influence student beliefs and attitudes one way or another, but to serve as a vehicle for getting students to critically view the issue of animal's vs. people's rights. The results from this classroom activity seem to suggest that students rely more on their feelings than their knowledge of science concepts in assessing the issue. This paper will outline instructional procedures used in the unit, describe assessment procedures and provide additional insight into using children's literature in science classes.

Explosive growth in the power and availability of multimedia offers enticing new opportunities for learning (McKenna, Reinking, Labbo, and Kieffer, 1999; Topping and McKenna, 1999). Multimedia technology combines speech, text, graphics, sound, video, animation, and special effects to convey meaning. Computer disk read only memory (CD-ROM) provides instant access to a diversity of multimedia materials that

may be used to facilitate language and literacy learning (Horney and Anderson-Inman, 1999; MacArthur, 1999). For example, with the click of a computer mouse, children can travel the Oregon trail, publish books, meet undersea creatures, and take virtual tours through the animal kingdom.

The use of children's literature in the teaching and learning of science is a topic of interest to both science education researchers and classroom teachers (Mayer, 1995; Cooter & Flynt, 1996; Neal & Moore, 1991; Royce and Wiley, 1996; Schallert & Roser, 1996; Vacca and Vacca, 1996; Butzow, and Butzow, 1988). While some research studies have shown that the integration of children's literature and science enhances literacy development, increases student understanding of difficult scientific concepts and increases interest and participation in science (Yore & Shymansky, 1991), other studies present a less positive view of incorporating children's literature into science classes (Mayer, 1995; Rosenblatt, 1991). From the points-of-view of many elementary teachers, incorporating children's literature into a science program is seen as a positive innovation, and understandably so. Many elementary teachers may feel ill-prepared to teach science (Pratt, 1982) yet feel very competent in using children's literature in their elementary classrooms. Finding time for science also is a problem faced by many elementary teachers. There is often little time for science in an overcrowded curriculum, but it can be "worked in" when integrated with children's literature.

There are numerous ways in which fiction and nonfiction books can be used in an elementary science classroom. Probably the most common way children's literature is used in elementary science is to provide factual information about a given topic. Children's books can provide a depth and richness not found in textbooks because children's literature is usually limited to one topic rather than the broad but often superficial coverage of topics in most science textbooks. Because science content is presented within the world that students know, they are able to make connections between science concepts and their personal worlds. Abstract concepts become more understandable when they are presented in a context that children can relate to (Butzow & Butzow, 1989; Dowd, 1991). Children's books can also create interest in a topic because they are enjoyable, fun to read and relevant to children (Casteel and Isom, 1994; Crook and Lehman, 1990; Hammond, 1992; Stiffler, 1992). Additionally, using children's literature in a science classroom can

encourage participation in science careers, develop critical thinking skills (Dowd, 1991), support the teaching of process skills, support inquiry (Hammond, 1992), encourage problem solving, and integrate cognitive and affective ways of knowing (Moser, 1994). From a practical standpoint, there are many reasons why the use of children's literature in science is beneficial, but there is not a strong research base supporting use of this strategy (Rice & Rainsford, 1996),

CHILDREN'S LITERATURE AND ENVIRONMENTAL EDUCATION

The goal of this study was to describe the effects of children's literature on students' existing attitudes and beliefs toward environmental issues. The focus was on one particular purpose for using children's literature in science -- to integrate affective and cognitive ways of knowing. Using *There's an Owl in the Shower* by Jean Craighead George as an organizer, two sixth grade classes studied environmental principles related to endangered species and reexamined their existing beliefs. Within a Science, Technology, and Society (STS) framework, students were encouraged to make judgments about endangered species based on environmental principles and their personal values. Dowd (1991) states that fictitious stories about nature which incorporate scientific facts can increase children's understanding of ecological principles and environmental problems and Moser (1994) suggests the use such books can contribute attention to values as well as knowledge.

Research by Rosenblatt (1991) identifies two methods by which students read: reading for content (efferent reading) and focusing on feelings while reading (aesthetic reading). The aesthetic method of reading is one that is given less attention in science classes and there is little research on the effect of this kind of reading on students' attitudes and perceptions. The aesthetic dimension is believed to help children make connections between facts more easily when they are engaged in the story (Crook, 1990). Children's literature, unlike most science textbooks, deals with controversial science related issues in which the reader can gain insight beyond simply knowing "the facts" (Morrow, Pressley, Smith & Smith, 1997).

There's an Owl in the Shower is an example of a book that lends itself to aesthetic reading because the story evokes an emotional response from the reader. The purpose of using the book as part of the

instructional strategy was not to influence student beliefs and attitudes one way or another, but to serve as a vehicle for getting students to view more than one side of an issue and to develop critical thinking skills. This paper will outline instructional procedures used in the unit, describe data collection procedures and provide additional insight into using children's literature in science classes.

DESCRIPTION OF THE PROJECT

Participants

Approximately 35 sixth grade students took part in this project and comprised the entire sixth grade of a rural Idaho middle school. The school is located in a rather isolated setting and draws students from three communities, all with populations of less than 500 people. The school community is composed of modest, working class families who have to work very hard to support their large families. Most of the students live on farms and many are avid hunters. In fact, the first day of deer season in this community is a school holiday. Before sixth grade, students have limited experiences with science and in sixth grade students are departmentalized for their core subjects, including science. The teacher who facilitated this project had 10 years of science teaching experience, a Ph.D. in science education and extensive experience in using a Science Technology and Society philosophy in teaching science.

Instructional strategies

There's an Owl in the Shower by Jean Craighead George was the fictional story that provided the organizer for the sixth grade science unit on endangered species. The story is set in a small logging community in northern California where a debate is raging between environmentalists who want to protect the spotted owl and loggers who want to protect their jobs. Protection of the spotted owl's habitat has cost the main character's father his job as a logger, and the young boy sets out to kill any spotted owl he sees. When the boy discovers an owlet lying on the ground, he decides to rescue it, assuming because it doesn't have any spots, it must be a barred owl As the owlet matures, it becomes clear that it is actually a spotted owl. In taking care of the owlet, the boy and his father come to realize how important the creature is to a healthy ecosystem.

During the course of the reading of the book, the teacher conducted numerous science and language activities to emphasize the science content that was a part of the story. The students dissected owl pellets to get an understanding of the diet of owls and their place in the food web. Students also participated in activities from both *Project Wild* and *Project Learning Tree* curriculums as well as teacher-developed activities. The purpose of these activities was to assist students in developing an understanding of the importance of food chains, food webs, overpopulation, natural resources and ecosystems. Students' understanding of key ideas was assessed through journal writing, the creation of a children's book based on an environmental issue, and the creation of informational pamphlets on a chosen local endangered species. Based on these forms of assessment, the teacher determined that students had a good understanding of each of these environmental concepts.

Data collection and analysis

Prior to and at the completion of the unit, students were asked to respond to a scenario in which they had to choose between the rights of people and the rights of animals (See Appendix A). The scenario was based on a local theme, dairy farming, which was a topic that all the students were quite familiar with since many of them lived on dairy farms. The instructional unit took two months to complete and the post-scenario assessment was administered two months after the completion of the unit, allowing for four months between pre and post tests. Additionally, mid-way into the unit when the reading of the novel was completed, students were asked to respond in writing to a question related to the book which asked them to choose which side of the issue they agreed with, the environmentalists trying to save the spotted owl's habitat or the loggers (See Appendix B). Students were also asked to give reasons to support their answers. A statistical analysis of students' responses indicated no significant differences between pre, mid or post assessments. Moreover, there were no gender differences in any of the categories. In the table below, group responses are summarized.

Table 1

Students Attitudes Related to People's vs. Animal's Rights

	PRETEST	AFTER READING STORY	POST-TEST
Favored people's rights over that of animals	41%	19%	30%
Favored animals rights over the rights of people	44%	69%	57%
Undecided	15%	12%	13%

DISCUSSION

Prior to beginning the unit, students' responses to the survey scenario were evenly divided regarding peoples' vs. animals' rights. The "undecided" group could see both points-of-view and chose not to take a stand either way. After reading the story, the majority of students felt empathy for the plight of the spotted owl and identified with the environmentalist cause. Just as the main characters in the story changed their opinion about the plight of endangered species after actually interacting with a spotted owl on a personal basis, so did the students after reading the story. Yet, four months later when given the post-test scenario which did not relate specifically to the owl but rather to something they themselves could relate to in real life, the number of students favoring animals' vs. peoples' rights began to decrease. This could indicate that the change in attitude due to reading the book was short lived and did not transfer to other more personal relevant situations.

The finding that raised the most concern, however, dealt with the reasons students gave to support their opinions. As previously stated, in reviewing the research on using children's literature in science, some proponents (Dowd, 1991; Moser, 1994) state that fictitious stories about nature can increase children's understanding of ecological principles and

can contribute to students' knowledge. There was no evidence to support this claim in this study. Even though other measures demonstrated that students had a good understanding of the ecological principles taught as part of the unit, none of the students used these to support their opinions on either the post scenario or the mid-unit assessment.

Rather than relying on the factual principles that they learned during the unit, students responses were based on an emotional response toward either people or animals. It does not seem unreasonable that students of this age should begin to use facts to support their beliefs. A developmental framework for environmental education programs developed by Kelly and White (1975) suggests that at the upper elementary/middle level, students begin to see the distinction between fact and opinion and their relative worth as a basis for decision-making. Even though they were encouraged to support their opinions with facts, students relied solely on their emotions and feelings toward the issue. While attitudes of caring and concern are certainly beneficial for students to develop, some believe that the discussion of ecological issues outside the realm of principles and their relationship to the total environment is to "encourage mindless sentimentalism" (Labinowich, 1971).

Students of all ages need to develop attitudes of care and responsibility for living things and the environment, but as students reach the upper elementary and middle school level, these attitudes should be not be based only on statements that they "simply love all animals" or that "people should be able to do what they want with their property." These types of statements were representative of every comment offered by students in this study as support for their opinions. The scientific principles that the students were supposed to be acquiring through this unit of study, became unimportant in their decision-making process. A recommendation for teachers resulting from this study is one of caution when using children's literature in teaching about the environment. Environmental topics are common ones in the elementary school, but there is a danger that rather than developing critical thinking skills in students, we turn them into advocates for a particular point-of-view based not on the principles of science but solely on emotions. From this small study, it appears that much more emphasis should be placed on critical decision making as a skill for upper elementary students. Certainly, we want children's books to touch the hearts of students, but from a science perspective we also want to take advantage of the richness

of science content that is embedded in stories like *There's an Owl in the Shower*

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Appendix A

Scenario

Tony and Jennifer have been helping on the family farm since they were very little. It is their job to help clean the barns, pick rocks in the fields, move water pipes and help milk cows very early in the morning before school. Both Tony and Jennifer have learned to drive a tractor and know the importance and expense of buying and maintaining farm equipment.

The family has recently been told by government officials that some of their farming practices are harming wildlife in the area. They are being instructed to make changes in their farming practices or they will have to pay very high fines.

Tony and Jennifer find out that to change their current farming practices will cost a lot of money. The family is worried that they may have to drastically change their lifestyle due to loss of money and it could possibly result in the loss of their farm.

1. Do you think it is fair that people should have to change the way they make a living in order to protect wildlife?

2. What is your opinion based on?

Appendix B

There's an Owl in the Shower
by Jean Craighead George

1. Pick one side of this issue that you support : loggers or environmentalists.

2. Tell why you support this side. (Give specific reasons to back up your answer!)