TEACHING CONTENT AREA LITERACY IN INFORMAL LEARNING ENVIRONMENTS

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Abstract

In the United States, visits to informal learning environments [ILEs] such as zoos, have historically been considered to be important educational experiences that promote increased student achievement in content-area subjects. Recently, however, funds are more likely to be diverted away from field trip experiences, depriving less-privileged students of opportunities to build rich background knowledge structures that could support long-term learning. This article considers the findings of a study that examined the effects of a visit to a community zoo on the science achievement of 3rd grade students. The findings suggest that although the novelty of the zoo environment may have served as a distractor in the short-term, in the long term, novel stimuli may have promoted increased learning by generating interest, increasing motivation, and providing students who had never before visited a zoo with sensory information to construct new and durable knowledge structures. Educators should therefore strive to provide less privileged students with more frequent opportunities to visit ILEs so as to expand their world knowledge. In addition, teachers are advised to consider how texts and classroom-based learning experiences can be used to complement visits to ILEs.

Introduction

Educators and policy-makers alike agree that a major goal of public school education is to promote durable learning among students. Yet, often the means to that end is called into dispute. Historically, field trips to informal learning environments [ILEs] such as science centers, zoos, museums, theaters and parks, were considered important, if not essential learning experiences that connect abstract concepts with the real world. More recently, however, it has become increasingly common for schools and districts in the United States to sacrifice field trips in favor of devoting resources to standardized test preparation (Weingarten quoted in Koebler 2011). As this paper will demonstrate, visits to ILEs have great potential to positively affect student achievement, particularly the achievement of less privileged students who often lack exposure to such novel learning environments. When combined with enhanced classroom instruction, visits to ILEs may even have the potential to narrow or close the achievement gap between privileged and less privileged students.

What Are ILEs and Why Are They Important?

The term, ILE, refers to spaces beyond the classroom that have the potential to educate. Examples of ILEs include zoos, museums, science centers, theaters and parks. While education may not be their raison d'être**,** many ILEs do have overtly educative goals. For example, the Smithsonian in Washington, D.C., claims to "bring content experts and educators together to strengthen American education" and even offers a Smithsonian Early Enrichment Center "that places children at the center of every experience. The vast collections are the foundation for the culturally diverse curriculum" (Smithsonian Institute n.d.). Zoos, science centers, museums and theaters frequently offer year-round education programs. Even parks often include a reference to education in their mission and vision statements.

ILEs are important in that they support students in building the background knowledge that "provides a conceptual framework for comprehending" (Reutzel, Camperell and Smith 2002, 321). Background knowledge "influences what students attend to, what inferences they make, and what they remember after reading" (324). Science centers, zoos and parks have the potential to promote enhanced comprehension of science concepts among students, while museums often provide an informative backdrop for understanding concepts related to history or civics, and theaters may encourage a deeper understanding of art and literature. Not only does enhanced background or world knowledge increase students' ability to

comprehend what they read, it provides abundant content for students' own writing since ILEs are rich with unique sensory experiences and they encourage first-hand explorations. One of the most compelling arguments for visiting ILEs, is that they are highly novel environments, and such novelty may be associated with increased learning outcomes (Fenker and Schutze 2008), perhaps because they are inherently interesting and motivating.

Guthrie and his colleagues identify two types of interest: situational and personal. Situational interest can be defined as a "positive but temporary affective responses to a stimulus or activity" (Guthrie et al. 2006, 242) while personal interest is a "more permanent, strong predisposition for participation in activities or for pursuit of certain goals" (242). ILEs, which are inherently interesting, create situational interest. Exposing students to "environments that stimulate situational interest is one way for schools to motivate students and help them make cognitive gains" (Hidi and Harackiewicz quoted in Guthrie et al., 233). Further, Guthrie and Knowles (2001) consider "real world" interactions, such as those that occur at ILEs, to be particularly motivating. Students appear to agree. According to Cerini, Murray and Reiss (quoted in Braund and Reiss 2006), students rated "going on a science trip or excursion" as the most enjoyable way of learning science (1375). By increasing exposure to inherently interesting environments such as ILEs, educators can not only increase situational interest, thereby increasing students' motivation to learn, but they can promote the development of students' personal interest in topics to which students may have lacked exposure.

Narrowing the Gap between Privileged and Less Privileged Students

In order for schools to avail themselves of the benefits that ILEs have to offer elementary students, they must schedule field trips. While some countries, such as Australia, place a high value on the affordances of ILE's, in the United States, field trips appear to be becoming less and less frequent (Koebler 2011). This lack of robust funding for field trip excursions in the United States is an unfortunate and ill-advised trend that may have a particularly deleterious effect on children who hail from less privileged backgrounds.

Gee (2004) uses the terms "privileged" and "less privileged" to discriminate between children who hail from middle class families and those who come from families outside of the economic, linguistic and cultural mainstream. Children in this latter group often come from urban environments and lack opportunities to observe and interact with the natural world. In addition, less privileged children are more likely to be raised in poverty, to be members of a cultural or linguistic minority group, to live in neighborhoods that are characterized by urban violence, and to attend struggling schools. Unless public schools make a concerted effort to schedule field trips for these children, less privileged students may have no access to the type of learning that occurs in informal learning environments. Consequently their understandings about the world may be seriously limited.

Kenny (2009a) interviewed teachers from urban schools whose third grade classes had visited a community zoo three times in connection with three different science units. Kenny reported that the teachers observed that their students were motivated to learn and the teachers characterized the students' learning as "long-lasting" (19).

> Teachers used descriptors such as "excited," "interested," "fascinated," and "enthusiastic" to describe students' responses to the lessons and zoo visits. A teacher observed, "The kids loved it." Another stated, "It was thoroughly suited to what they were interested in, so they were enthusiastic." (19)

Overall, the teachers agreed that the field trips were well worth the investment of time and money and that the educational benefits of visiting the zoo outweighed the challenges associated with taking students on a field trip.

The Effectiveness of a Community Zoo on the Science Learning of Third Grade Students

Zoos are a specific type of ILE that aspire to educate visitors. Like other ILEs, zoos have the potential to prompt students to build world knowledge and to engage with the physical world. However a feature unique to zoos is that they contain unique animals. These animals may be of greater interest to children than less unique animals as evidenced by findings reported by Tunnicliffe (1998). The author reports that primary students who visited a zoo made more observations about the animals observed than primary students who observed more commonplace animals at a farm.

Design of the Study

Kenny (2009b) conducted a quantitative, quasi-experimental investigation in order to examine the effectiveness of a community zoo on the science learning of urban elementary students. Participants included 158 third grade students whose intact school groups were assigned to one of the following three treatment conditions: zoo visit with enhanced instruction [Zoo+ group]; zoo visit with traditional instruction [Zoo group]; and enhanced classroom-based instruction [Classroom+ group]. The study employed a pre-, post-, and two week delayed post-test design. Although historically, standardized testing indicated slight differences in academic performance between the schools, no differences were noted between the three groups at pre-test. The researcher provided third grade teachers at the participating schools with lesson plans related to a unit on primates, a topic that was chosen as it was likely to be of high interest to the students.

Findings

Kenny (2009b) hypothesized that the Zoo+ group would out-perform the Zoo group and the Classroom+ group at post- and delayed post-test. These two latter groups were intended to serve as different types of controls. The Zoo group was intended to control for the effect of the enhanced instruction, while the Classroom+ group was intended to control for the effect that the zoo visit had on student science achievement.

The findings demonstrated that all three treatment conditions promoted increased achievement from pre-test to post-test. Surprisingly however, the Classroom+ group outperformed the students in the two zoo conditions, even the group that received enhanced instruction in connection with the zoo field trip. At first glance, these findings appear to provide evidence against investing in visits to ILEs. However such an interpretation of the findings would be overly simplistic. In fact, when contextual factors are taken into consideration, the opposite appears to be true.

As discussed previously, historical standardized testing data indicated slight differences in academic achievement among the three schools. In addition, there were differences among the groups with respect to socio-economic status [SES]. Students in the Zoo+ group were from the school with the lowest SES, and were historically the poorest performers on standardized tests. According to anecdotal data, many of the children in this group had never been to a zoo before. In this instance, as Schwerha, Wiker, and Jaraiedi (2007) suggest, the novelty of the learning environment may have served to disrupt the learning that was measured by the post- and delayed post-tests. Teachers reported that the children were fascinated by the unique sights, sounds and smells and found it difficult to focus on the content of the lesson, given the powerful smells, the roar of the lions, and the playful chatter of the monkeys (Kenny 2009b).

Despite these “distractions”, the Zoo+ group performed equally well when compared to the Zoo group. This is no small achievement considering that the members of the Zoo group hailed from a school

with higher SES and higher standardized test scores. In addition, the school that was assigned to the Zoo condition was located a mere 0.39 miles from the zoo. Students at this school tended to visit the zoo, both in and out of school, far more frequently than their peers assigned to the other two conditions. For all intents and purposes, the lion and the monkeys were their neighbors. Thus, the sights, sounds and smells of the zoo environment were not novel to these students, nor did they serve as distractors to learning. When these contextual factors are taken into consideration, it appears that the visit to the zoo in combination with the enhanced instruction, served to close the achievement gap between higher and lower SES groups. The less advantaged students performed equally well as their more privileged peers at post-test.

The delayed post-test results are even more compelling. According to post-test data, both zoo groups made statistically significant gains from post-test to delayed post-test two weeks later whereas the classroom-based group did not. These findings suggest that students who visited the zoo continued to make meaning related to the lesson content even after the unit ended. Further, teachers of the Zoo+ group suggested that the full potential of the zoo as a learning environment was not fully realized. They believed that their students, many of whom had never visited a zoo before, did not have time to sufficiently acclimate to the novelty of the environment. Lubow, Rifkin, and Alek (1976) suggest that, "enhancement of learning is achieved when a new stimulus is presented in an old environment or an old stimulus [is presented] in a new environment" (38). The authors assert that learning is less effective "with conditions of no contrast between stimulus and environmental novelty" (41). The students in the two "control" groups (Zoo and Classroom+ group) received instruction that provided the contrast associated with enhanced learning, as both groups received instruction about novel content in an environment that was familiar to them. The Zoo+ group, in comparison, received instruction related to novel content in a novel environment. As Kenny (2009b) observes,

> With respect to the study-specific outcome measure the zoo environment likely served to distract student attention from the content of the lesson. This statement is not intended to suggest however that the visit to the zoo was not a valuable and productive learning experience for these children. According to a participating teacher, the [Zoo+] students' visit to the zoo was perhaps the highlight of their academic year. Rather than being an isolated event, this experience became a focal point for class discussions throughout the entire year. [The children] frequently revisited concepts they had learned in connection with the Primates lesson. In addition the children often framed new knowledge within the context of experiences that they had had during their zoo visit. According to the teacher, "All we heard about all year long was opposable thumbs!" This teacher's comments suggest that the zoo visit made an important contribution to children's background knowledge, enabling them to…build new knowledge structures, structures which will serve to support future learning. (159)

Conclusion

Although complex, the findings of this investigation suggest that attention should be paid to the potential of ILEs to promote learning and to increase student achievement in content area subjects. In particular, educators should strive to provide less privileged, urban students with more frequent opportunities to visit ILEs so as to expand their world knowledge. When visiting a novel environment, teachers are well-advised to provide students with sufficient time to acclimate to a novel learning environment and to adjust learning goals to suit the background experiences of the students. As Paris and Hapgood (2002) suggest, "sometimes the impact of the experience may be implicit, subtle and difficult to articulate and assess…Therefore learning (in the traditional sense [as measured by tests]) may or may not occur and does not have to be the goal of a visit to an ILE" (39).

Finally, teachers are advised to consider how texts and classroom-based learning can be used to complement the learning that occurs in ILEs. Kenny (2009b) observes that,

> A question that should be considered in the future is not which type of inquiry is more effective (observation-based or text-based), but rather how and to what extent traditional and non-traditional texts can be used to support first-hand learning experiences. (163)

It is possible that had the Zoo+ group been exposed to text-based inquiry strategies in addition to observation-based learning experiences, they may have demonstrated even greater learning gains.

ILEs represent a substantial investment in time, effort and money. It is only natural for educators and policy makers to carefully weigh the costs of field trips to ILEs against the benefits. Yet, if the ultimate goal is to promote long-term, durable learning, particularly among less privileged students, then such visits appear to be well worth the investment.

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