Understanding Student Comics: Using Comic Books as a Data Collection Tool to Investigate Learning on Field Trips

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Abstract: This poster presents findings from analyses of student comic books that documented a field trip to an art, science, and technology museum. Findings include that comics allowed students to demonstrate via words and images more than acquired content knowledge, including understanding about diverse aspects of the trip like affect and social situations (average alpha = .86) and testify to the reliability of the comic as a promising tool for researchers interested in learning across contexts.

Theoretical Framework

How can researchers and educators measure and assess what K-12 students "take away" from a field trip? Increased attempts at measuring and assessing student learning on field trips has occurred in the past several decades, particularly among researchers interested in how students learn science in such contexts as science museums, science centers, zoos, acquaria, arboreta, and other informal science learning sites. This study builds upon previous work that explores "how alternative learning contexts affect learners' understanding of a topic" (Zeidler & Surber, 1993,) in particular how learners understand a field trip in its entirety, including affect and social interactions that occurred during the trip in addition to acquired content knowledge (versus particular exhibits or aspects of an exhibition).

Learning is mediated by local cultural practices and perspectives and takes place not only in schools but in numerous contexts and practices across the life span (Banks et. al, 2007). Field trips to places outside of school have occurred in conjunction with school-based learning since at least the early 1900s when Benjamin Ives Gilman (1915) critiqued the role of the museum docent during field trips for visiting school groups. In general, most researchers interested in field trip learning identify learning as a process, for example one that involves the application of prior knowledge and experience to new experiences within physical contexts and that is mediated in the actions of other individuals (Anderson, Lucas & Ginns, 2003). However, as noted by Griffin, field trip learning involves more than cognitive or conceptual change, but also includes "social interaction, cultural norms, and a range of tools and methods" (Griffin, 2004, p. 60). This study attempts to understand how we can use alternative sources of data, namely student-generated comic books, to gain insight into that process.

Methods and Data Sources

The students in the study attend an urban K-6 public school in the Puget Sound region. The school has approximately 422 students, of whom 53% are White, 27% are Asian, 13% are Black, 6% are Hispanic, and 1% are Native American. About 25% receive free or reduced price lunch. The sixth-grade students, comprised of two sixth-grade classes and a mixed 5th/6th grade class, spend 3 ½ days at "RiverGlen." RiverGlen is promoted in museum brochures as an outdoor learning center with a mission to "inspire environmental and community stewardship by providing hands-on learning experiences that link science, technology, and the arts in a natural setting." At RiverGlen, students work in field groups of eight or nine students with an adult chaperone and a museum teacher or "field guide instructor."

The broader study, from which this study about comics comes, incorporates a multi-sited ethnographic approach (Eisenhart, 2001) to "trace relationships that stretch out across time and space" (Eisenhart, 2001, p.22) as students visited an exhibition hall, pond, and marsh, and other areas. An extensive data set, including videotaped observations and the digitized student artifacts was generated as part of this approach. The comics were an assignment given by the teachers that the author proposed at the beginning of the school year as a way to obtain information about students' thoughts and feelings about the museum visit in a different kind of format, one with which students would be familiar as they are used to reading comics and watching cartoons and that would allow for creative self-expression through both images and words in a pictorial sequence. The use of images is similar to the use of drawings in the journals and is commonly used when the students illustrate stories or essays for other assigned projects. Theoretically, comic books "convert thoughts into forms that can traverse the physical world and be re-converted by one or more sense back into thought" (McCloud, 1993, p.195). The students were introduced to the assignment before they left for the RiverGlen while they were still at school and were required to hand in their comics two weeks after the trip. The students' essays and comics were viewed by the teachers, parents or family members, and fellow students, while the journals were usually only viewed by the teachers and, possibly, parents or family members.

The author gave the students a sample comic (created by the author) about a girl who visits a science museum for the first time. The comic tries to communicate the girl's apprehension before the visit, how she describes

various activities in which she engages at the museum, including providing information about different museum staff encountered, and gives advice about what to do when going to a museum, such as making sure to bring a journal and a camera. Students were given blank pages with empty comic panels on them and told they could use one or two sheets, which would equal two or four comic book pages respectively. Most students followed the same format as the sample comic by talking about their feelings before the trip, describing what they did, alone and/or as part of the group during the trip, and providing advice to others who might visit RiverGlen in the future.

A total of 36 comics were analyzed for this study. The author and three other researchers engaged in two coding sessions based on a breakdown of areas of interest generated by the author in accordance with the RiverGlen curriculum and review of other data. After initial coding and discussion, consensus was reached about coding categories and guidelines about what kind of content was considered appropriate for each category. A total of seven categories emerged, each broken down into subcategories of words and images. Three researchers engaged in coding of the comics during the second session and this data was used to check for inter-rater reliability across the categories using Cronbach's Alpha of .70 or greater. Only one category, environment, is not considered reliable using this criteria. (See table below).

<u>Conclusion and Significance</u>

So, what did students take away from their field trip? In contrast to a teacher-mandated reflective essay that limited students to interpreting their field trip experience in terms of environmental science education only, the comics demonstrated that students understood the field trip as being about more than just science content knowledge acquisition, although the means of instances of science words and science images were the highest (5.33 and 3.52, respectively). For example, in terms of affect, students used images and words to describe expectations and feelings such as anxiousness, happiness, excitement, fear, nervousness, and sadness. Students also described learning about historical events and people, art making, and numerous and diverse kinds of social interactions with adults and peers, including references to friends and sports and other activities with friends. (Future work will explore further the areas of environment and other to deconstruct what students took away outside of the aforementioned areas).

In general, the comics provided detailed insight into student understanding about learning during the field trip that was not available through other data sources. Field trips are about much more than acquisition of content knowledge and these comics show exactly how students interpret what happens and how. Future research about comics and other alternative data sources is necessary to build upon this insight.

<u>Table 1: Inter-rater Reliability.</u>

Subject/Area Overall Reliability	Words	Images
Affect = .81	.88	.83
Science = .93	.93	.94
History/Social Studies = .93	.95	.91
Art = .98	.97	1.0
Social = .93	.90	.92
Environment* = .66	.53	.36
Other = .80	.68	.69

*inter-rater reliability .70 (Cronbach's Alpha) not achieved

References

Anderson, D., Lucas, K. B., Ginns, I. S. (2003). Theoretical perspectives on learning in an informal setting. *Journal of Research in Science Teaching 40*(2), 177-199.

Banks, J., Au, K. H., Ball, A. F., Bell, P., Gordon, E. W., Gutiérrez, K. D., Heath, S. B., Lee, C. D., Lee, Y., Mahiri, J., Nasir, N. S., Valdés, G., Zhou, M. (2007). *Learning in and out of school in diverse environments: Life-long, Life-wide, life-deep*. Seattle: The LIFE Center.

Eisenhart, M. (2001). Educational ethnography past, present and future: Ideas to think with. *Educational Researcher* 30(8), 16–27.

Gilman, B. I. (1984). The museum docent. In Nichols, S. K., Alexander, M., Yellis, K. (Eds.) *Museum Education Anthology 1973-1983: Perspectives on Informal Learning, A Decade of Roundtable Reports*. Washington, D.C.: Museum Education Roundtable, 148-161.

Griffin, J. (2004). Research on students and museums: Looking more closely at the students in school groups. *Science Education* 88 (*Suppl. 1*), S59-S70.

McCloud, S. (1993). *Understanding comics: The invisible art*. New York: Harper Perennial.

Zeidler, A. L., Surber, J. R. (1999). Understanding topic, structure, and importance of information in a visual and verbal display. *Journal of Experimental Education* 67, 114-132.