LEARNING INSTRUCTIONAL TECHNOLOGY THROUGH AUTHENTIC TECHNOLOGY ARTIFACTS

Abstract

The purpose of this paper is to describe a project and present a summary of the results of a quasi-experiment on the effect of the use of authentic and collaborative technology projects in for teaching undergraduate Instructional Technology. Specifically, this paper will describe how the design and development of authentic technology products situated in the k-12 context, may affect student performance, learning of technology, quality of technology projects, and course satisfaction in a pre-service teachers' Instructional Technology Course. In this experiment the pre-service teachers collaborate with in-service teachers from the local School District to create authentic technology products fit for the k-12 context, as negotiated with the teachers. Results show that this project did not significantly impact students' performance but positively affected student attitudes toward using technology for teaching and learning, and changes the quality of the projects they produce.

Rationale & Research Questions

This study contributes to the scholarship of teaching and learning in Instructional Technology for teachers by looking at how the production of authentic technology projects may enhance pre-service teachers' understanding and knowledge of using technology for instruction in the k-12 setting.

Literature on learning suggests that learning is situated in context (Lave & Wenger, 1990; Brown, Collins, & Duguid, 1989; McLellan, 1995). That is, meaningful learning does not always take place in a vacuum in a classroom, but rather in activities where knowledge is anchored the real world context. Applying this concept to pre-service teachers' learning of instructional technology, it makes sense to provide them with the opportunity to learn instructional technology in the k-12 setting. However, the pre-service Instructional Technology course in this university has traditionally been "classroom bound," where students sit in their college computer labs and create instructional technology projects individually. Since it is a 200-level class, these students have not had other education classes, field experience, or internship. As a result, they do not have much understanding of the real constraints of the k-12 schools, curriculum, and practices. These constraints result in technology projects that may not be best suited for the k-12 scenario.

This study allows students to collaborate with in-service teachers to produce authentic contextualized technology products that the designated in-service teachers can actually use in their classrooms. During this process, the pre-service teachers will apply their course knowledge to become consultants, co-designers, co-developers with the school teachers. While the pre-service teachers are expected to get a chance to apply

their course knowledge, the school teachers will provide content knowledge, the context, and the practices of k-12 teaching.

As this represents a new way of teaching this undergraduate instructional technology course, the impact on student learning has yet to be determined. Therefore, this research will provide insight on the teaching of this course, and students' learning through the use of the design and development of authentic technology products situated in the real-world k-12 context.

The specific research questions for this study are as follows:

1. Does the use of authentic technology projects affect student performance in class?
2. Does the use of authentic technology projects affect students' attitudes towards instructional technology?
3. Does the use of authentic technology projects affect the quality of the projects?

Method

Participants

The participants are approximately 44 students from two sections of undergraduate instructional technology course.

Procedure

The participants are pre-tested to control for their prior technology knowledge. The treatment group (one section of undergraduate instructional technology course) works in groups with designated k-12 teachers from the local School District to design and produce technology projects which the k-12 teachers propose. Each group is assigned a k-12 teacher to work with. The collaboration commences after some instruction in the instructional technology class. The students consult with the teachers by providing technology expertise, while the k-12 teachers provide content knowledge, context, and curriculum for the production of the technology projects. The students then develop the projects for the teachers. The control group (one section of students from the undergraduate instructional technology course) works on the technology projects in class, which they traditionally do. Both sections of the undergraduate instructional technology courses are tested again at the end of the semester on their technology skills and knowledge. Their technology projects/artifacts are collected and analyzed.

Assessment

With the use of two groups, the researcher investigates the proposed research questions through a quasi-experimental design, and some qualitative methods. The students from both the treatment and the control group are pre-tested at the beginning of the semester, and surveyed at the end of the semester. In addition, their technology artifacts as well as their course grades taken from tests and exams are compared and analyzed.

Pre-test: In this pre-test, students are asked to rate their technology skills, knowledge, and attitudes and beliefs about the use of instructional technology through using 5-point likert scale responses to statements such as:

1. I am familiar with the use of basic word-processing software.
2. I am confident with creating technology for teaching.
3. I enjoy using technology for learning.
4. The use of technology will enhance learning.

Post-test: The students are given the same questions as in the pre-test, and asked to rate their responses on a 5-point likert scale.

Analysis of technology projects: The projects are analyzed through using a rubric including categories such as authenticity, creativity, skills, complexity, and usefulness.

Results

This section describes the results of the study according to the research questions. Question 1 asked if students' final grades were significantly different compared to those who were not involved in this project. The students' final grades were compared and analyzed using the T-test, but there was no significant difference between the treatment and the control groups at alpha =.05 (see table 1)

Students' final grades	Mean (N=18)	SD (N=36)
Treatment	87.23	6.61
Control	85.86	7.68

Table 1: Students' final exam results show no significant difference.

Research question 2 asked if students' attitudes toward the use of technology would be different when engaged in authentic projects compared to those who did classroom-bound projects. Again, the results are not statistically significant. However, a closer look at the data suggests there is a trend. Table 2 shows a positive trend that the treatment group had rated their attitudes consistently higher than the control group. With the exception of one question, students who engaged in the authentic technology projects were consistently more positive about the use of technology for teaching and learning, and for integrating technology in the future. The question which shows a flip of the results has to do with whether they think they can make decisions about how and when to use technologies. Since the students engaged in real-world projects which are less well-defined, it was harder to for them to be precise about how and when to use technology for teaching. The ratings are done on a likert scale of 1 to 5, and the statements were:

1. I will use technology in the teaching profession
2. Technology is useful for teachers
3. Technology will improve student learning

4. I can easily come up with examples of how to use technology for teaching
5. I can easily integrate technology in the classroom teaching
6. The projects I created in the EDUC 204 class can be used in the real world
7. Technology is essential for teaching and learning
8. I can make decisions about how and when to use technology for teaching
9. Technology can help me to achieve my teaching goals and objectives
10. As a result of this class, I know more about teaching.

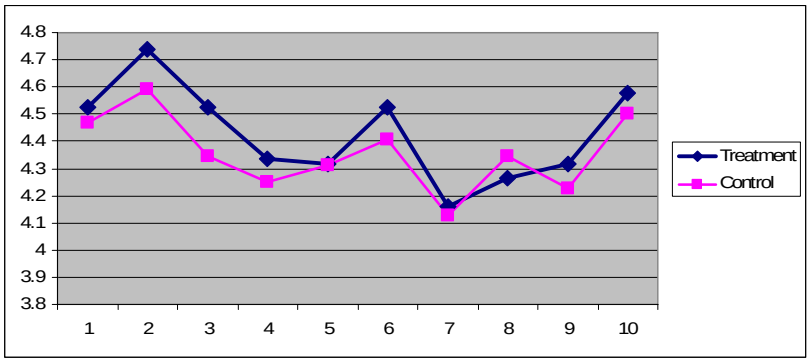

Table 2: Student attitudes toward the use of technology in the future.

Research question 3 asked if the project affected the quality of the projects created. The details of each project are analyzed and differences emerged between those created in the treatment group, and those created in the control group. Those who participated in the authentic projects used a wider range of technologies, had more ill-defined projects that were more open-ended and complex than those who engaged in the classroom projects. The technologies used for the classroom projects were mostly powerpoint and web-design, whereas those who worked on the school (authentic) projects also used other technologies, including database, and spreadsheet technologies. The authentic projects had boundaries that were harder to define, because they originated from real world problems, whereas the classroom projects were more well-defined.

Conclusion

Although this project did not produce statistically significant results, it has produced data which suggests the positive benefits of engaging in authentic technology projects, contextualized in the real world. The small sample size might have negatively impacted the statistical analysis. However, the qualitative analysis showed differences in the quality of the projects, as well as the process of creating these projects. The data seems positive in suggesting more positive attitudes toward technology when participating in the creation of authentic projects. These results indicate that the learning experience can be very different when it is situated in the real world context.

Acknowledgements

This project would not have been possible without the SOTL grant, and Coastal Carolina University's support. I would also like to thank the Horry County Schools and Myra Reynolds for helping make this possible.

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