Teaching, Doing, and Sharing Project Management in a Studio Environment

The Development of an Instructional Design Open-Source Project Management Textbook

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In this article, the authors present an example of a project-based course within a studio environment that taught collaborative innovation skills and produced an open-source project management textbook for the field of instructional design and technology. While innovation plays an important role in our economy, and many have studied how to teach innovation, few have looked closely at teaching the social aspects of innovation that are a critical part of most innova-
tive organizations. Project-based learning has been shown to be helpful in preparing students to work on real-world projects, and utilizing a studio environment, where collaboration is fostered, can provide an added measure of authenticity. In this article, the authors discuss the characteristics of this course and its project-based approach that seemed to support collaborative innovation.

Introduction
In the information age, we have seen the rise of a new creative economy (Banahan & Playfoot, 2004; Castells, 1999; Peters & Besley, 2008), driven by innovation. In this setting, an individual is not as powerful as a group, and Sawyer (2008) has argued that collaboration can lead to “group genius” and more impressive innovations. Indeed, social innovation is a significant part of many of the most innovative companies and organizations (Brown, 2008; Catmull, 2008; Moultrie et al., 2007).

Given the importance of innovation in our society, it is critical that we understand how to prepare students to be innovators, particularly in social settings. This is especially true since many scholars have claimed that higher education institutions may not be properly preparing students to be innovative (e.g., Belski, 2009; Katz, 1994; Ramocki, 1994; Smoot, 2006), instead banning innovation instruction to “rhetorical flourishes in policy documents” and the “borderlands of the visual and performing arts” (McWilliam & Dawson, 2008, p. 634). Additional research is needed to produce effective models for teaching social innovation in higher education. Courses in which project-based learning is used in a studio environment may foster aspects of social innovation without explicitly teaching them.

In this article, we discuss a graduate level course on project management. The course design was innovative and centered on the methodology of project-based learning. This design fostered collaborative innovation skills while not expressly teaching those skills. We will examine the course design, discuss the experience of the students, and show what aspects of collaborative innovation the course promoted.

Project-Based Learning and Studio Environments

Innovation training often utilizes project-based learning, an instructional methodology that can provide a more authentic and engaging learning experience (Newell, 2003). Participants are required to find and investigate the problem, then develop and evaluate solutions. Design and engineering courses taught at many universities apply this methodology in their capstone projects, in which students design and develop a product for actual clients (Dutson, Todd, Magleby, & Sorensen, 1997; Pimmel, 2001). Dym, Agogino, Eris,
Frey and Leifer (2005) argue that such practical and authentic experiences should be used more often to teach students to be innovative.

While providing an authentic project is crucial to learning, providing an authentic environment, one in which collaborative innovation can take place, is also essential. Drawing from research on social learning, creativity, and organizational development and behavior, West (2009) and later West and Hannafin (2011) outlined key principles related to the fostering of innovation within interactive communities. They explained that key characteristics of innovative communities included individual qualities (e.g., dynamic expertise, hacker-like motivation, and inquisitiveness); organizational qualities (e.g., granting autonomy and ownership to community members; fostering diversity in techne and cognition; unorthodox and shifting community boundaries, visions, and goals; and a strong sense of psychological safety and trust) within group processes such as flow and group reflection.

Studio-based learning is one method to potentially create communities in higher education, like the one described by West and Hannafin (2011) — communities that provide the level of collaboration often found in successful, innovative companies. Reimer, Cennamo, and Douglas (2012) asserted that studio environments provide students with many advantages. For instance, because of their collaborative, team-based nature, studio environments promote creativity. Student self-confidence is also enhanced, since they have autonomy over their learning and see progress. Peer learning is increased because students are able to communicate their thoughts and explain concepts to their classmates. Explaining ideas and having meaningful experiences with what is being taught increases content mastery.

There are several characteristics of studio environments that enable better project-based learning. According to researchers at Rensselaer Polytechnic (The Mobile Studio Project, n.d.), studio environments should have integrated lectures and labs in which there is less time allocated to lectures. Dimian, Cojocaru, and Ursuleanu (2012) confirmed the importance of these lecture-labs, arguing that the traditional format of lecturing for three hours and having students attend a one-hour lab each week makes it difficult for students to grasp abstract concepts taught in lectures that are not yet tied to their experience in the lab. By integrating mini-labs within the lectures, Dimian et al. (2012) found that it was easier for students to understand abstract concepts because they can immediately perform the experiments meant to help teach the concepts.

Researchers at Rensselaer Polytechnic (The Mobile Studio Project, n.d.) have also claimed that working collaboratively in groups with high levels of interaction between instructors and students are important elements. Students should be actively involved in constructing their own knowledge, which can be achieved by providing them with opportunities to learn through hands-on activities. It is also important that they have a shared learning environment that is supervised by an instructor who is a master of the craft. Instructors should also encourage students to reflect on their work as they participate in design projects throughout the class (Brocato, 2009).

It is apparent that project-based learning, as a pedagogy within studio environments, can help teach students collaborative design and innovation. In this article, we examine one case study and describe the characteristics of a graduate studio environment utilizing project-based learning approaches. This course focused on the design and development of a project management, open-access textbook, and the course itself fostered creative thinking as well as an innovative final product.

**Description of the Course and the Product**

This course was a semester-long, graduate-level course on project management for instructional designers. While this class was not meant to teach collaborative innovation explicitly, the course was taught in a studio environment and produced an innovative product by implementing useful ideas generated by the students (Scott & Bruce, 1994). Students were overwhelmingly positive about their experiences in the course. The class was composed of six students and an instructor who worked as a team member.

When designing the course, the instructor experienced frustration due to the lack of textbooks and other instructional materials written specifically to support project management in the instructional design context. In response to this lack of resources, the instructor chose to take an open textbook (see Hilton & Wiley, 2010) on project management written for use in the business school context and adapt it specifically to managing projects in an instructional design setting.

While pondering the task of rewriting the open textbook, the instructor was also looking for a real-world project that students could manage as part of the course. Rather than simply learning about project management, the instructor wanted to engage students in managing a project, which he believed would be more authentic and beneficial. Eventually, the instructor brought these two design desiderata together by choosing to use the textbook rewrite as the project that students would manage. While the instructor chose the project, students were given a significant amount of autonomy to make decisions about the final product.

As a group, students decided that the new version would be available exclusively in an electronic format to allow the inclusion of multimedia components as well as an assessment tool. Students also identified content they could modify, such as project management examples focused on business applications, to tailor the book more towards instructional designers. Students then broke into
three teams to manage and develop the project. A programming team chose to “jailbreak” the old version of the text (i.e., extracted a copy of the formatted textbook content from the Web-based platform hosting it), and developed a new Web platform to host the revised book, which included an assessment tool. A multimedia team filmed interviews with three different instructional design project managers, who shared their experiences and lessons learned, with question prompts corresponding to the topic of each chapter. This team also found photos with a Creative Commons license that could be included in the book. Finally, a content team created more relevant chapter introductions and examples and developed assessment questions. The final product was made available at www.idpm.us. A newer version of the book, with more features, was developed during a second offering of the course. This second version, and all newer versions, has moved to www.pm4id.org.

It is worth noting that, at the end of the semester, the instructor asked students two questions. First, he asked, “Was your grade in this course ever a focus of concern?” to which the students answered “No.” Then he asked, “Did you work harder in any other course than you did in this course?” Again, students answered, “No.” The instructor pointed to this unmatched commitment and engagement, independent of students’ concern for grades, as the true measure of the effectiveness of this instructional approach.

Seeking Evidence that the Course Supported Collaborative Innovation

From previous research, we have learned that collaborative innovation skills can be taught in engineering and design studio contexts (West, Takeishi, Wright, & Fonoimoana, 2012). However, little is known about how to foster social innovation in non-engineering educational settings. By examining this graduate course, we sought to answer the following questions:

1. What characteristics of the project management studio environment appeared to support collaborative innovation?
2. What instructional principles could guide the design of educational settings and instructional practices to foster students’ development of social innovation skills?

The study was initiated after the course was concluded. The instructor and five of the students were interviewed about their experience, the roles of each group member, and general events that occurred throughout the semester. The interviews were audio recorded and coded by a member of the research team using Critical Incident Technique analysis strategies (Flanagan, 1954). Because of the collaborative and creative nature of the activity, we analyzed the data using the Communities of Innovation (COI) framework as an analytic lens (see West, 2009), but new codes were also allowed to emerge when they indicated significant and critical aspects of the experience not covered in the COI framework. When there was a question about how an event should be coded, other members of the research team collaborated to determine the best choice.

Themes of Collaborative Innovation Present in the Course

While not all of the COI elements were evident in the data, we will address the most important COI themes as well as other themes that emerged during the analysis.

Ownership

Nearly all of the students mentioned a sense of ownership as being an important factor in their experience. The students felt they had ownership over the project, collectively, because the instructor did not give a specific set of expectations for the project. Instead, the students were allowed to make decisions about how it would unfold. Students felt ownership not only over the project in general, but also over the parts of the project that they worked on individually. Rob (names have been changed) explained that they defined areas of responsibility within each of the groups so they had “little kingdoms within their own areas of focus.” Brent said, “each of us can look and say ‘I wrote those intros [or whatever part a student created].’”

Motivation

The feeling of ownership was also a major motivation factor for students. Since students were able to pick which aspect of the project they would work on, most chose to do a task that they found interesting. Some chose their task because they had previous experience or expertise in a certain area (e.g., programming). Some students also felt that it was motivating just to be able to work with others, in part because it was more fun than working alone.

On the other hand, some of the motivation was more extrinsic in nature. Since students knew they were creating a product that might be used by others in their field, they were motivated to work hard. The instructor explained that “part of the students’ identity was tied up in the project, and they worked hard so it would represent their vision of their identity.” They did not want their names to be attached to a product of poor quality, nor did they want their classmates to be frustrated by a lack of effort on their part, so they worked hard to fulfill their personal responsibilities.

Community

All of the students had a sense that collaboration was a key aspect of their experiences in the class. For instance, although everyone in the class had a different idea about how they wanted to approach the project, they made decisions by consensus. They had to learn to be flexible and accommodating and move from an
egocentric vision to a shared vision of what they were going to do for their project. They learned that having conversations, both in class and in smaller groups, helped them work out criticisms and concerns about the project and enabled them to become unified in their goal for the project.

In addition to commitment to the project, the students felt they could openly and honestly share their opinions about the project. Rob explained that when Jason and Matt presented new ideas about the project to the group that "it wasn't an ambush and Jason and Matt didn't want to take over the project." They did want input from class members about their alternative proposal. Fortunately, students “felt free with sharing their ideas, and they were very honest about how they felt” (Brent). Although no one explicitly stated it, an underlying aspect of their ability to be open and honest seemed to be the level of trust and respect the students had with each other. This trust and respect allowed them to be more effective in developing important divergent ideas that contributed to the final product.

Even though the students did trust and respect each other, they still learned that working with people can be difficult. Some of the greatest obstacles they faced in this area were differences in expectations and opinions. They came to realize that differences of opinion cannot always be resolved, and they had to learn how to compromise because they were still held accountable for producing a product, even though they had different perspectives.

Authenticity

A few students commented that this class helped them with the things they were working on professionally by allowing them to improve the skills they had and work more effectively. Brent explained that for his job, he was very interested in learning more about open educational resources. In this class, they used strictly this type of resource, so it was “perfect for [his] own development and the development of [his] work.” The design project they worked on helped him see that he does not have to find an open resource that is already perfect for it to still be useful. At the end of the semester, he felt that he could put his experience on his resume and take the project they had created to his employers and coworkers as an example of a great open educational resource.

In addition to the product they created and the resources they used, Brent felt it was valuable to learn principles of project management. During class discussions, he often ran through scenarios he faced at work and tried to determine what his work team was doing well and what they should do differently.

As Brent pointed out, this class offered them a point of comparison for their other experiences. For instance, Rob said, as a result of this class, he realized that some of his past managers were unpleasant to work with, in part, because they did not effectively follow principles of good project management. Lisa explained that during the class, she reflected back on other projects she had managed and was able to see what she had done well, and what she could improve upon for the future. The experiences of these students demonstrate that this point of comparison helped students gain a better understanding of how they could be effective project managers in their future careers.

Not only did the course help them learn skills they could use in their personal careers and experiences, it gave them a sense of what it would be like to work in the industry. Rob explained that they learned about several skills and resources that might be useful to them, even though they didn’t use them specifically in the final product. The course also gave him a good sense for how teams might work together in the industry.

Mentoring

In this studio environment the instructor acted as a resource, a tutor, and a guide. He asked questions to find out what the students were learning, and pointed out things that were happening instead of letting them pass by. Many of the students felt that the instructor was the overall project manager because he had the most knowledge and experience. He tried to be an enabling project manager and was skilled at presenting himself as just another person with ideas. He gave the students autonomy over the project, but he did have veto power and sometimes re-directed the students if he felt that the project was getting off track. He established certain goals for them but did not have strict requirements for how things must be done. Brent explained that “Too much guidance from [the instructor] would have limited them and made them want to rely on his knowledge and expertise. He didn't have a set vision, but let the teams be in charge.” He was very approachable and gave appropriate help to the students by providing them with the tools they needed and opportunities to use them. However, he never provided a specific answer about how things should be done. Instead, he offered appropriate scaffolding when the students did not know how to proceed. These interactions helped push the students to learn, work hard, and experience what it is like to be a project manager.

Fostering Collaborative Innovation in a Course

In this article, we have described a successful project management course that implemented project-based learning in a studio environment to not only teach the content of project management but also foster collaborative innovation skills. Through interviews with the participants, we found evidence that the following characteristics of their experiences were critical to their learning how to be innovative: (1) student ownership over the project; (2) the students’ personal, strong motivations to produce high-quality work; (3) a strong sense
of community among the students, allowing them to critique and improve upon each other's work without giving offense; (4) an authentic project to work on that related to their professional endeavors; and (5) effective faculty mentoring that supported their own decision-making.

We recognize that this study was based on a small class and so our evidence is limited. However, this study raises some potential implications for future teachers and instructional designers. For instance, this study provides some initial evidence that properly utilizing the elements of project-based learning and studio environments can facilitate social innovation. These elements include having a real project, which in the case of this class, was one that would be widely distributed with the students' names attached to it. This added an extra level of motivation for the students to perform well. Allowing students to choose which part of the project they are going to work on and giving them a wide degree of latitude to be innovative within that domain provides not only motivation but also an increased sense of ownership that was crucial to the successful completion of the project. The role the instructor played was also critical, as he did not lead the project but allowed the students to do so, only intervening when necessary to help the students successfully complete the project.

References


