Using Real-World Projects in Constructivist Learning Environments

Andy Law, Ph.D.

School of Business, Kwantlen University College

Abstract

A constructivist learning environment [1], which involves students in real-world projects, is believed to be able to motivate students in learning. However, a real-world project must not only have a real end-user but also a connection to the community. In this paper, I explain in terms of an Activity System why real-world projects are important in learning environment design. I discuss why problem ownership is important in motivating students in learning. A real-world, community related project called Youth Can Do Information Technology (U Can Do IT) 2006[1], which was integrated into the INFO4230 class, is used as an example to demonstrate the idea. I also describe the form of involvement for a course instructor in the class projects. Finally, I summarized the lesson that the IT students had learned in the project.

1.   Introduction

INFO4230 teaches students of the Information Technology (IT) project management skills in the areas of integration, scope, time, cost, quality, human resource, communication, risk, and procurement as recommended by the Project Management Institute (PMI). Constructivists emphasize that a problem or learning goal must be owned by the learner, and suggest that learning should be situated in realistic settings. The adoption of simulated projects without real end-users is deemed to be less effective in motivating students in learning because the acquisition of the skills requires real-world experience. The use of a real-world project becomes a recommended requirement for the course.

2.   Projects as Tools in Learning

In this section, I explore the relationship between the project and learning activities and justify the need for real-world projects in learning environment design. The IT project management course can be viewed as an activity system [2]. Activity systems [3], which are developed on activity theory, are the basic units of analysis to alleviate problems that afflict the approaches to learning. An activity system has six components. Essential to the system are the relations between subjects (instructor and students), the community of which they are members (the field of IT), and the object of their activities (IT project management skills). Such relations are mediated by a number of factors, including the tools (lectures, assignments, tests and project) used by the subjects, the rules (course objectives) that link subjects to their communities, and the roles (instructor educates students) adopted by the community. If one of these components is ignored, tensions may appear in the system. Tensions in an activity system have been explained in the activity theory by contradictions. These contradictions are the major factors of poor quality learning. That is why a real-world, community related project is preferred to

a simulated project because the concerns of the students, the instructor, and the community in the former are equally important.

3.   Problem and Solution Ownerships

In 2006, a funded, community-related project called U Can Do IT [4] was integrated into the INFO4230 class to aim to motivate students in learning and to allow them to learn the required IT project management skills through solving real-world problems. Constructivists emphasize that a problem or learning goal must be owned by the students in order to motivate their learning. Forty-five Bachelor of Technology (IT) students were in charge of the U Can Do IT project. They were divided up into groups. The groups were to visit the local high schools, educate high school students on information technology, and deliver a quiz. Once the quizzes were graded, on site, the winners were identified and invited to the final round, Web based competition. The testing engine, which was used to run the final competition online, was also developed by the IT students. IT students are logical thinking people and rely heavily on computing tools in communications. In the project, the IT students felt pressure in the first two weeks because they received no reply of their email invitations. They realized in the third week that they had to combine both personal and email invitations in order to get response from the high school coordinators. They started mastering the skills in the fifth week, and found themselves at the end had learned the required skills. The project was well received by about 500 students from 22 high schools.

4.   Instructor's Involvement

Constructivism assumes learning should be integrated with the tasks. Since a task always has a goal, an initiative must be attached to each goal because it is the first action to perform the task to solve the problem [5]. Constructivists have not identified whether the student or the instructor should take the initiative to solve the problem. Obviously, a high level of active learning can be attained only if the initiative is taken by the student. Should instructors help to remove all constraints applied to the learning environment? The answer is "no". After an initiative is taken by students, the instructor's job is to provide background information of the project to students, followed by some examples of real-life problems and solutions. In addition, instructors should provide just-in-time suggestions only after a problem has happened. The objective is to make sure that students take the initiatives to work on their problems right from the beginning to the end. In the U Can Do IT project, each group has one project manager, two project leaders and six members. With such a big group, communication among members is always a problem because there is a maximum of thirty-six communication channels for a group of nine. Each group had foreseen at the beginning the problem and had proposed various methods to minimize the problem. Since there is no single solution for all types of communication problems, students adjusted their communication plan from time to time to come up with a tailor-made solution for their group.

5.   Lessons that IT Student Learned

The following paragraphs are excerpt from the final reports of some groups.

…..We learned that face-to-face communication was useful and even essential to establishing contact and maintaining good relations with our school contacts.

…..Another problem was effectively managing a group this large. We noticed that it was difficult making sure everyone had something to do, and that work was not piled up on just a few members.

.....The online message board has been a great success.

…..What we learned mostly during the development of the website was interpreting the stakeholder requirements.

…..Some individuals preferred to work alone and they had a hard time sharing responsibilities or information with other team members. It is very important to plan everything.

…..We've all learned that just creating a plan is useless without monitoring and following the plan through

…..Sometimes things go wrong; it may be inevitable. The important thing is how we react to these situations. In this project we had an instance where we made a mistake that affected another team. But we took responsibility as a team and made up for our mistake.

…..We should trust each other and give team members the benefit of the doubt.

6.   Conclusion

A real world, community related project is a key component in learning environments design. I explained why such type of project can have a better student motivation in learning. The integration of a real-world project in a class is always a challenging task. With appropriate assignment of the problem and solution ownerships and instructor involvement, students' motivation in learning can be greatly improved.

References.

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