

Personnel Cooperation in Distributed Courses

Räisänen, Sanna-Maria, Ala-Mutka, Kirsti & Mikkonen, Tommi
Tampere University of Technology, P.O. Box 553, FIN-33101, Tampere, Finland

Abstract: Open Source Courseware project (OSCu) aims at cooperative course development and implementation in university level software engineering education. Since implementing distributed courses requires active collaboration between course personnel, it is important to analyze the development aspects for cooperation in these courses. Activity Theory offers a theoretical basis and useful concepts for analyzing and evaluating the activity system of the course personnel. This article presents the main activity components and contradictions found in the system. A critical analysis helps to find solutions to the contradictions and to improve the technically supported cooperation of course personnel in this special course implementation model.

1 Introduction

When distributing course implementation to several universities, active collaboration between course personnel is needed to assure equal quality of teaching and learning in every participating university. Developing systematic activity models for course personnel and their work coordination needs careful planning, and Activity Theory offers good means for analyzing and understanding the collaborative work required.

This paper describes the collaborative implementation of distributed courses in Open Source Courseware (OSCu) project for building a basis for future development. Section 2 introduces briefly the principles of the OSCu project. Section 3 describes the activity system model and its components for course personnel in distributed OSCu courses. Section 4 presents the main problems discovered this far and section 5 concludes the paper.

2 Distributed courses in Open Source Courseware project

Software engineering education in universities often faces a lack of teaching personnel due to the large number of students and the wide, constantly changing area that needs to be covered on the courses. Many universities use students and researchers as teaching assistants on courses, which again leads to the problem of constantly changing personnel. These problems are common to many universities and were the reason for starting Open Source Courseware (OSCu) project to find solutions for them using university cooperation, by sharing the work of developing and implementing courses. The OSCu project consists of two major components, a common course material bank and a distributed course implementation model for utilizing the common materials by several universities at the same time.

The project aims at transferable course materials that contain enough information for another teacher to take the course, teach it to students, and develop it further. An OSCu course is a constantly developing entity consisting of course materials and ways to teach their contents. Developing such a course requires experts of the topic and experts in teaching to develop the contents and practical working methods for the course. The cooperative distributed course model was developed to offer universities a possibility to become acquainted with the issues related to the course implementation in practice. In this model, one university is responsible for designing the course, developing and updating the materials for it, controlling the progress of the course, and implementing the lectures via videoconferencing for all universities. The remote universities have local tutoring assistants to take care of the local organizing issues, exercise sessions, and all tutoring tasks for their students. Cooperative course implementation

makes it possible to develop high quality courses, since feedback and suggestions can be received from students and personnel of many universities. And, moreover, the competence invested in the courses can be reused with this model.

OSCu project coordinator develops guidelines and ensures that all teaching personnel have correct understanding of the project goals and guidelines and of their tasks on the courses. More information on the OSCu project ideas and experiences can be found in [1] and [2].

3 The activity system of course personnel in distributed courses

OSCu courses aim at developing well-functioning collaboration routines for course personnel that support course distribution and students' learning without limiting the teaching methods and tools. The course personnel activity model in OSCu courses has been described according to the activity system model defined by Engeström [3]. Figure 1 presents the primary components that constitute an activity system and their concrete counterparts in an OSCu course. This model concentrates on teacher collaboration and consciously leaves out students, that naturally are also objects as well as actors on any course.

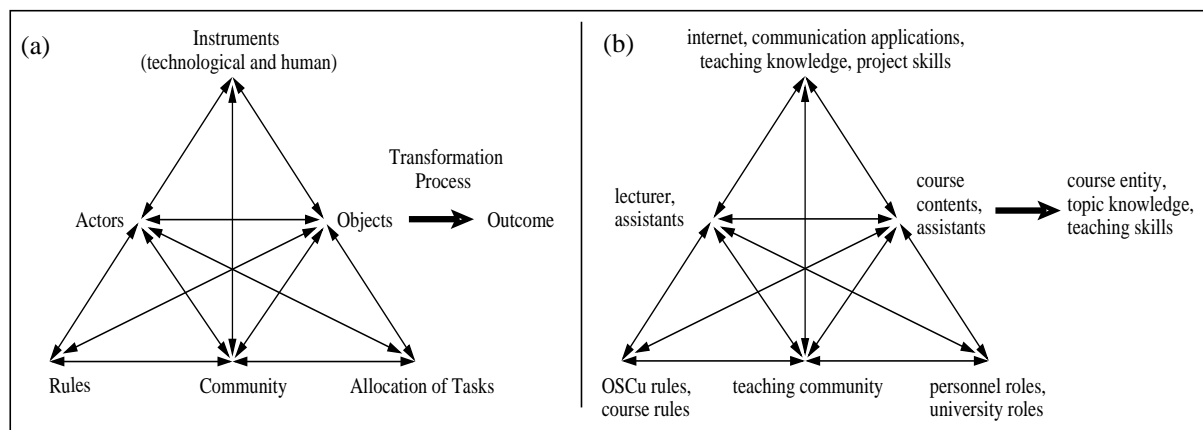


Figure 1. (a) Basic model of activity systems [3].

(b) The activity system of a distributed OSCu course (from the personnel viewpoint).

The group of actors on a course consists of all teaching personnel in different universities. They are supposed to be interested in the issues covered on the course and, moreover, interested in participating to the teaching of the course. Actors should have knowledge of communication and teaching tools required on the course, as well as enough knowledge of teaching methods and the course topics as is needed in their work tasks. They are required to know and to follow the rules of the course and to implement the designed task allocation model.

In the OSCu courses, all the actors are also activity objects, since the aim of the cooperative process is also to increase knowledge and skills of the teaching personnel. Their learning is affected by the other actors, coursework tools, allocation of tasks, etc. When considering continuous course development, the goal of the process is to develop the materials and the teaching practices of the course. The resulting course implementation and materials are affected by e.g. coursework tools, teaching methods, course rules, teachers and their task allocation. The success of the community cooperation affects to the quality of the course contents and to the teachers' self-development.

Technical tools and instruments are in a very important role, since they facilitate the continuous communication that is essential for personnel cooperation in distributed settings. The means of communication used in the OSCu courses are face-to-face meetings, meetings via phone together with desktop sharing and e-mail. An important communication channel is the

course material bank, that delivers up-to-date teaching materials, instructions for their usage, and the minutes of weekly meetings with course status reports. Human instruments, e.g. project skills and teaching skills also have an important effect on the community cooperation.

Rules for activities on OSCu courses are partly given by OSCu coordinator, who develops them actively by following courses implemented in the project. In practice, each course creates its own rules that apply the given general rules especially for the course in question. Rules need to be much more carefully designed than in a local situation, since in this kind of multi-site project, common practices are otherwise difficult to achieve. There exists documented OSCu rules for e.g. course Web-pages, allocation of tasks, personnel communication, feedback collection, course material production and a checklist for course preparation.

Allocation of tasks is defined in OSCu rules by dividing different tasks to different roles with work amount approximations. These roles define all the tasks that need to be taken care of in a distributed course, containing e.g. communication and documentation activities much more than in a locally implemented small course. The tasks can also be allocated by delegating course development responsibilities to several universities, as opposed to having only one university responsible of all course contents and process planning.

Course implementation requires continuous cooperation and communication from all course personnel, to assure the same level of learning support for students in all universities. Several tools, rules and allocation of tasks are required to define a well-functioning system, that can also be documented as a course entity that is possible to repeat later with new teaching communities. Successful cooperation produces thoroughly documented materials with careful instructions for both students and teachers, feedback analysis and a structured description of course materials and implementation. Also all the course personnel gain a good understanding of the topics of the course and of the way the course can be effectively implemented.

4 Contradictions in the activity system

4.1 Primary inner contradictions

Actors: The course personnel changes from one year to another. It may be difficult for a course personnel to adopt the OSCu cooperation culture and different working methods during a single course. On the other hand, working year after year in the same course may be boring and frustrating. Another problem relating to the actors is that working in a distributed course requires a lot of autonomy from everyone in the course personnel, but also cooperation and teamwork skills are needed. So, the personnel has to tread a fine line between these two elements all the time during the course.

Rules: A member of a course personnel may face a conflict between his/her own working methods which he/she is used to follow and the models of work defined in the OSCu rules. Working in a OSCu course requires following the rules defined in the project in order to get the course to go right. But following and making own rules may feel like more relevant and motivating from the viewpoint of the course personnel. There may also be a need to modify the OSCu rules because they don't apply to all courses as such.

Allocation of tasks: Neglecting OSCu rules often causes problems with the participating personnel. A teacher may be required to take care of OSCu course tasks in addition to all his/her normal work tasks. Teachers in the OSCu courses may be motivated and willing to do the tasks according the OSCu guideline but the problem is the lack of resources. So, the teacher has to decide whether to carry out the tasks at the expense of his/her own time or to do the tasks with minimum work at the expense of the course implementation. At the worst, all the

tasks accumulates only to a few persons inside the course because others don't complete their tasks. The work tasks may also be unclearly divided inside the course. This makes it difficult for personnel to perform their tasks if they are not sure which tasks to do.

4.2 Secondary contradictions

Examining the contradictions within components of the activity system is not enough in order to improve collaboration. Also problems and contradictions between the components must be taken into account. In the distributed courses, these contradictions mostly occur between those components from which the inner contradictions have also been found.

The course personnel affects cooperation, rules, allocation of tasks and objects. For example, in the case of the cooperation, the quality of cooperation depends in many respects on the existing course personnel. The more motivated and skilled personnel, the better and more effective cooperation can be achieved. A typical conflict in the work process in distributed courses is the conflict between the personnel used to work independently, and on the other hand, the cooperation and coordination needed when aiming at a well-functioning course implementation in every university that participates the course.

The changing personnel brings difficulties into the course implementation, and therefore to all the other components of the activity system of the OSCu course. New persons are not familiar with the OSCu cooperation culture and with all its components, and this complicates the implementation and cooperation of the course. On the other hand, changing personnel may also have positive effects to the course implementation because it usually brings new perspectives in course development.

A typical conflict in the activity system can be found between the components of rules and cooperation or the components of rules and the allocation of tasks. Despite the general OSCu rules, some of the practices and rules regarding the existing course must be designed together with the course personnel, which has two sides. Decision to follow the rules generated by the OSCu project clarifies the allocation of tasks. On the other hand, this may reduce possibilities for flexibility in the allocation of tasks and cooperation. Making rules by the personnel themselves motivates cooperation, but it does not guarantee that all the tasks needed for a successful distributed course will be completed.

5 Conclusion

Describing the activity system in distributed courses requires recognizing all the elements and relations that affect course implementation. In the case of human activity, the elements also include factors like motivation, collaboration and commitment to the work. Partly because of this, the most important problems in the course activity system lie in the components regarding actors, cooperation and allocation of tasks. Without motivated personnel in a course, it is impossible to achieve a well-functioning cooperation, where everyone takes care of one's own duties. Vice versa, cooperation and effective allocation of tasks motivate the course personnel.

The theoretical basis of Activity Theory seems to be applicable for developing course personnel collaboration in distributed OSCu courses. Describing the model of the activity system and defining the most typical and important contradictions is the first step to begin the development work for technically supported personnel cooperation on the courses. Critical examination of the course implementation process and solutions to the contradictions can finally lead to new, sophisticated ways and forms of collaboration.

Developing the existing model and its practices is a time-consuming project, and requires

investments from all the actors linked to the course implementation and to the OSCu project. Analyzing only the course level and the present situation of courses is not enough when aiming at comprehensive development. In order to get a bigger picture of the collaboration work in distributed courses, also the activity networks between different components and their sub-components should be examined and the historical development should be taken into account.

References

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