

# Collaboration within Moodle: Sharing Documents in Real-time with Drag&Share

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**Abstract.** Moodle provides with tools to perform collaborative tasks. On these tasks, students are able to share documents and information. But the means provided by Moodle are not enough to perform some collaborative tasks, such as share documents in real-time. In this scenario users must be aware of what is going on the system effectively. We propose the use of Drag&Share within Moodle, a collaborative activity that allow users to share synchronously resources in real-time. Through this activity, teachers will be able to easily provide a shared workspace to students. There, students can share all kind of resources and be aware of what is going on the system, which are participating and what are they doing. All these features using standard technologies, such as HTML5.

## 1 Introduction

Educational spaces have evolved to an integrated environment with computer technologies. In blended learning [4] students' times are between physical interaction with other students, teachers, and virtual environments. Resource sharing is a relevant collaborative task on e-learning scenarios. Problems arise while performing this collaborative activity. Students receive all the information they need from the physical environment in face-to-face scenarios. But all these information is not available on e-learning platforms. Users must be provided with the necessary awareness in collaborative learning. Endsley [3] defines awareness as "knowing what is going on". This knowledge should answer to specific questions about users' environment. Gutwin [5] has defined the awareness framework for collaborative learning. Appropriate awareness techniques are needed to answers these questions [7]. In real-time collaborative tasks, answering the question "what are the others doing?" is a crucial one for maintaining awareness [6]. To make easy the design and the complexión of online collaborative tasks, such as resource sharing in real-time, arise the need to offer solutions that allow teachers and students to use successfully new possibilities and features offered by educational environments. These solutions should provide users with the necessary mechanism to make them aware about what is going on in the system. Our proposal is based in Moodle environments, and introduces Drag&share [1] inside Moodle as an activity.

The rest of the paper is organized as follows. First the related work is described. In

the next section Drag and Share on Moodle is described. Next an evaluation is included. Finally conclusions and future are presented.

## 2 Related Work

Sharing resources among students is widely used in collaborative activities. Students are able to share pieces of information in physical environments such as when they are in a classroom. They use all means available in his environment to share several kinds of resources. Moodle is a software package for producing Internet-based courses. As a virtual learning environment provide means allowing users to perform learning tasks. Administrators and teachers can design courses and offer tools to perform all kind of activities. These courses can be divided into sections to organize the students' work. On each section, teachers can use two kinds of actions: add a resource or add an activity. Each section can contain as many activities and resources as the teacher desires.

Moodle offers a number of ways to share content adding resources. A resource is an item that a teacher can use to support learning. Resource types enable almost any kind of web content to be inserted into the course. There are several kinds of resources available on Moodle. For example, files consist on a picture, a PDF document, a spreadsheet, a sound file, a video file or any other format. Folders help to organize files and one folder may contain other folders. The label resource can be a few displayed words or an image used to separate resources and activities in a topic section, or a lengthy description or instructions.

An activity is a general name for a group of features in a Moodle course. Usually an activity is something that a student will do that interacts with other students and or the teacher. There are fourteen different types of activities in the standard Moodle. For example, assignments enable teachers to grade and give comments on uploaded files and assignments created on line and off line. Chat activity allows participants to have a real-time synchronous discussion. Database enables participants to create, maintain and search a bank of record entries. Forum activity allows participants to have asynchronous discussions. In Moodle, a site may add other activities that have been developed as contributed code and found in Moodle's Modules and Plugins<sup>1</sup> database. Therefore, is it possible to create personalized activities in order to achieve different goals.

### 2.1 Document Sharing and Collaborative Tasks

Sharing resources and performing collaborative tasks in Moodle can be done using some of the features above described. To share information, teachers can use resources to link to a wide range of documents. Students will be able to show and download these documents to his local devices. But students cannot use the resources available to share his documents with other students. As an alternative, they can share resources through some activities such as using a database or uploading documents in

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<sup>1</sup> <http://moodle.org/plugins>, 3 2012

the forum. This will help students to share documents and to perform collaborative tasks. Also they can use the chat activity to inform others about what are they doing in the system.

To share documents, a database can be used. This activity provides means to upload and store resources. Students could see documents uploaded by other students. To communicate with others, students can use the chat activity. Through this activity, they are able to express their ideas and to inform the group about his activities in the collaborative task. There, students can notify when they upload documents to the database activity. Analyzed activity involves to share pictures and to discuss with other students about those pictures. Therefore, two windows are needed in order to be aware about the pictures and the chat. The main activity window is in the background. In the foreground, are used the database window and the chat window. But there are problems related with these activities. In collaborative tasks students need to be aware about what is going on, that is, what other students are doing within the objects involved in the collaborative activity. In the described scenario, users must be paying constant attention to the chat window and the database window. Also, users have to follow several steps to upload images into the database and they have to repeat each step in case they want to upload more than one image. This may cause user's frustration and demotivation.

### 3 Drag and Share on Moodle

One solution to share resources within Moodle synchronously and in real-time is to integrate Drag&Share as an activity in Moodle. Therefore, teachers will be able to include as many shared workspaces as they want, according to their needs. To achieve this, we have developed a module called *dragandshare*. It is based in standard technologies and does not need any special software to be installed in the client system. It is very easy to include this activity in a course. Teachers only have to follow the same steps needed to add other activities to their courses. Drag&Share for Moodle is a module that allows students to share documents in real-time as an activity in Moodle. They can also communicate with each other easily through the means provided by the system. Students interact with the system dragging documents inside the shared workspace from anywhere in his computer. They act as they were working within his operative system, following the same principles. They can easily move documents, show and organize them as they want. Also, they can delete documents. All this actions can be done easily through the metaphors presented in the shared workspace. As a result of the features presented by Drag&Share, collaboration takes place in one window. On that window is shown the shared workspace. There, users are represented, as well as the shared documents, the action metaphors and the communication system. Users are represented through the multi-pointer system. Their movements are shown to other students in real-time. So, they are aware about the actions performed by other students. Documents are represented in the shared workspace with a correspondent metaphor. If the document is a picture, a preview is shown. Students may open documents and show their content dragging them to the corresponding metaphor. But through the representation of the document in the shared workspace, students are able to know the contents of the document before opening it.

Drag&Share allows students to drag and drop as many documents as they want simultaneously in the shared workspace. This action is described in the Figure 1. This figure is divided in three steps, numerated with ordinal numbers. First, there are four pictures in the student's desktop. The aim of the activity is to share those pictures with other students. In the second step, the student selects all four pictures from his desktop and drags them into the shared workspace. In the third step, the student drops the pictures inside the shared workspace. Pictures are shown in the shared workspace in real-time. All the students participating in this activity will see the pictures immediately.

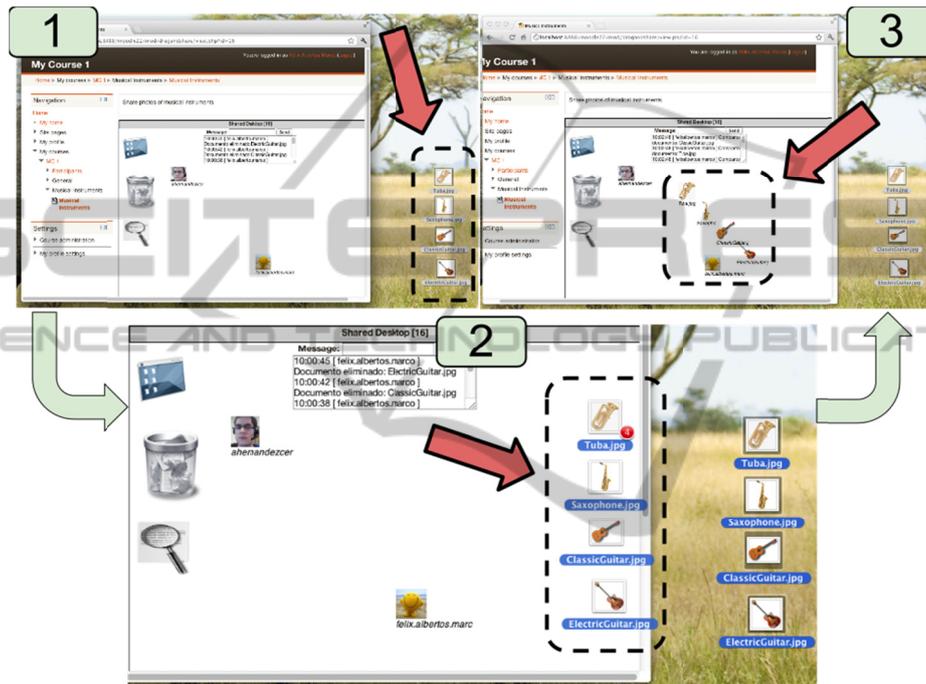


Fig. 1. Dragging multiple files into the shared workspace.

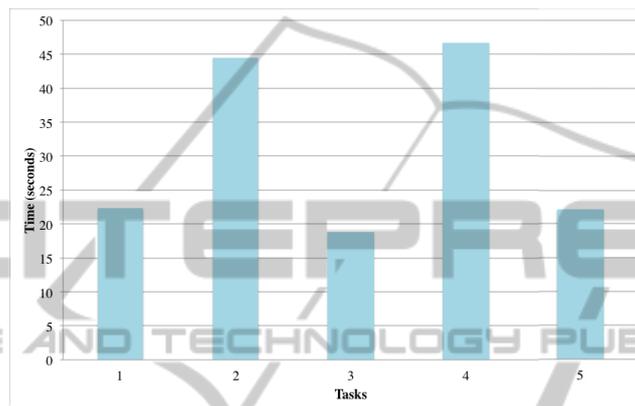
#### 4 Evaluation

The evaluation is focused on the level of productivity and user satisfaction using the system. Tasks time have been used to measure productivity. Satisfaction has been measured using a questionnaire based on SUS (System Usability Scale) test [2].

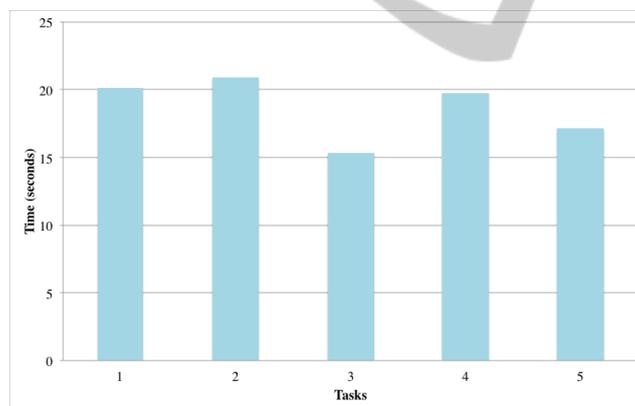
The evaluation has taken place in both scenarios presented. First, using Moodle's standard features. Second, using Drag&Share within Moodle. The test consists in a collaborative task performed in pairs (student A and student B). Two students shared pictures and discussed about which one was better. The collaborative task was divided into 5 representative activities within the process. 1) B realizes that A is in the system. 2) A uploads a picture and B realizes it. 3) B gives feedback to A about the picture. 4)

B uploads a picture and A realizes it. 5) A and B share information and discuss about which picture is better (measured time is only related with interface interaction).

Students knew how to use Moodle and were familiar with the environment. Therefore, there was no special instruction about how to use system. They received instructions about the task to perform and the tools to be used to be sure that they understood the task. The group of selected students to perform the collaborative tasks had the following features. Ten students composed the group. Seven students were males and the other three were females. The participants were nearly 23 years on average. The oldest and youngest user was 25 and 21 years old, respectively.



**Fig. 2.** Average time of each task on Moodle with default activities.



**Fig. 3.** Average time of each task on Moodle with Drag&Share.

The productivity of the system was analyzed based on the time spent to perform the collaborative task. This time was divided into the five task described above. The average time is shown in the Figure 2 for the test developed in Moodle with default activities, and in the Figure 3 for the test developed in Moodle using Drag&Share. The average time have decreased drastically in tasks where 2 and 4. Time has decreased slightly in the other tasks. In overall time have decreased when Drag&Share was used.

Regarding student's satisfaction, the SUS satisfaction questionnaire can be between 0 and 100. A final value near 100 indicates a complete satisfaction. The final value in Moodle with default activities was 46.75, which indicates that students were not satisfied with the system. The final value in Moodle with Drag&Share was 89.5, which confirms that users were very satisfied when using Drag&Share within Moodle.

## 5 Conclusions and Future Work

This paper presents Drag&Share within Moodle, a shared workspace inside Moodle that allow users to share resources synchronously in real-time. Through the evaluation of our proposal it is shown that analyzed task were dramatically improved through a time reduction in its completion.

As future work, to study related collaborative activities within Moodle is needed to continue improving collaboration within Moodle. The utilization of new standard technologies will improve the execution of real-time collaboration within Moodle.

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