A Framework to Manage through Control and Automation

A semester long student Project assignment in e-Learning Environment

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ABSTRACT

Managing semester-long project assignments is not always an easy task since teachers need to keep track of many elements of the project that will reflect in a proper assessment of the students' work. Integrating an LMS into the educational process and therefore to assign, track, and assess the project may add to the complication, this can be very challenging and especially when students work in groups. Students expect support and guidance from teachers in all stages of the project. In turn, teachers should have access to vital information. Only then, the support will be effective and timely at these critical decision-making points. Learning Management Systems (LMS) tools support effective teaching and learning using various features.

In this paper, an approach is proposed to help teachers manage the project assignment by taking advantage of existing tool features provided by a commercial LMS. From the start of the project till the end, the approach fully supports the teacher's decision-making and the support students by helping them keep up with schedule, timeline, deliverables and important instructions related to their collaborative work. This approach has been implemented for many semesters and it has received very positive feedback from teachers and students as well. This approach can save time, increase the evaluation process e and can streamline the various processes involved in a typical project assignment.

Field of Research: *Project, Control and Automation, Learning Management System, Adaptive Release (Blackboard)*

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1. Introduction

Every semester, teachers hand out project assignment to students. Although the project description contains clear detailed information on what output are expected from students and how to produce them, students will still seek guidance from the teacher. In majority of cases the LMS is integrated with teaching and learning but even then, it can be very difficult for teachers to respond effectively in timely manner to students' needs in the various stages of the project. The instructional strategy applied is project-based learning. Problem-based learning is another distinct strategy to learning. However, both strategies share several characteristics (Donnelly and Fitzmaurice, 2005) including challenges. And, one big problem using such strategy is it is time-consuming to both teachers (Kilroy, 2004) and students (Wood, 1994). Matters can be further complicated when students collaborate in groups. In fact, the effectiveness of the teacher's response depends very much on the accessibility of critical information.

One approach is to guide the students through the project via a number of tasks; each task consisting of the necessary instructions and guidelines to complete that given task. Students can only view a single task at any given time and thus, they devote all their efforts at both individual and collaborative levels to complete that specific task. However, it is the responsibility of teachers to manage these views. In this paper, a framework is proposed with details of implementations of how in the case of Blackboard (version 9), the feature Adaptive Release (AR) is used to support this approach. The feature AR controls how contents are released to students based on a set of rules created by the teacher; the rules are related to criteria such as availability, date and time, scores of any item and so on (About Adaptive Release).

First, teachers divide a project into a number of inter-dependent stages. Each group of students views their respective stage and upon its completion, the group views a different stage till the end of the project. The advancement of all the groups including the promotion of the views is entirely under the control of teachers in an interactive and transparent way.

2. Project Background and Motivation

The course selected to implement this method and concept is a developmental computer course offered to first year University students.

At Foundation Program, Qatar University, the Computer course[1] was offered in two levels, one semester per level: level 1 (Computer 1) and level 2 (Computer 2). In the first level, students are taught the basics of computer, internet, e-mail and communications and Microsoft (MS) Word application. In the second level, students learn two additional tools, MS PowerPoint and MS Excel including introductory statistical functions. To get a passing grade in the second level, students have to submit a course project.

The Computer 2 course project is a team work comprising of two to three students. The selection of the team members is left to students. Once the team has been formed, the members agree on a topic and

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[1] This course was offered in the Foundation Program until Spring 2012.

the teacher approves it. Then, the students proceed to carry out research work and at the same time they have to submit draft versions of their work to show their work-in-progress. The main output is a presentation and it has to incorporate the features of the various tools they have learnt. After the students present their work to the class, the assessment takes place based on the criteria laid out in a rubric.

A project description file provides valuable information and guidelines to the students; however, in all stages of the project assignment, students turn to the teacher for guidance. To provide the most appropriate guidance to these students, the teacher must have access to key information. As examples, the teacher should know who the teammates are, how the research is being conducted, how the group is interacting, and have access to the artifacts the students produce. Thus, failure to hold and access such type of information may cause the students' project to deviate from the right track.

3. Proposed Strategy

The following strategy is proposed to fix the issues mentioned earlier.

The project assignment is divided into a number of stages with each stage consisting of a series of cohesive tasks. In this project, five stages are identified and they are namely:

1) **Stage 1** [*Partners*]: The team is formed.

2) **Stage 2** [*Research*]: The topic is selected and research is carried out to collect information on that topic.

3) **Stage 3** [*Development*]: The presentation is developed.

4) **Stage 4** [*Presentation*]: The team presents their work to the class.

5) **Stage 5** [*Grading*]: The project is graded.

From the start of the project, students work on a single stage. After they complete all the tasks pertaining to that stage, they move on to next stage until they reach the end of the project. However, it is the teacher who executes the stage promotion after he or she has verified that all related tasks are completed.

This strategy leverages the teacher's control to a maximum and mandates that all activities be tracked including that the stage promotion be supported by documentary evidence.

4. Implementation in LMS

Blackboard is used as LMS to implement the framework defining this proposed strategy. The complete implementation is detailed by the following five steps.

Step I

The "Project" menu item is created and serves as a placeholder for the information on the project and stages (Figure 1).
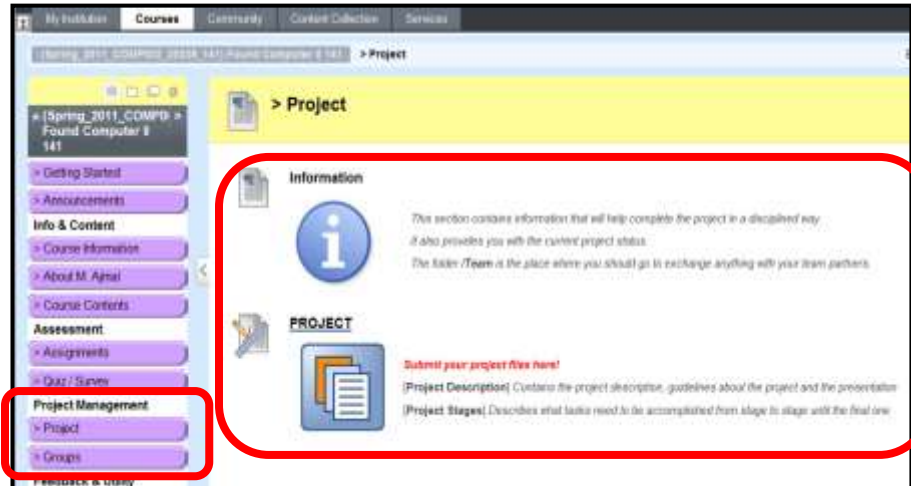

Figure 1: Creating Project Menu Item

Step II

The "Stages" items are created under the "Project" menu item. Thus, five stages are created for the five stages identified earlier (Figure 2). Each "Stage" item clearly indicates its associated tasks.

Figure 2: Creating Stages Items

Step III

A "Project_Status" attribute is used to keep track of which current stage the students are. This attribute is defined as a column or a grade in the Grade Center (Figure 3). It is recommended not to show this column to the students and the 'Points Possible" field can be set to the number of stages, five in this case (Figure 4). This attribute is mostly useful when promoting students to the next stage in a transparent way.
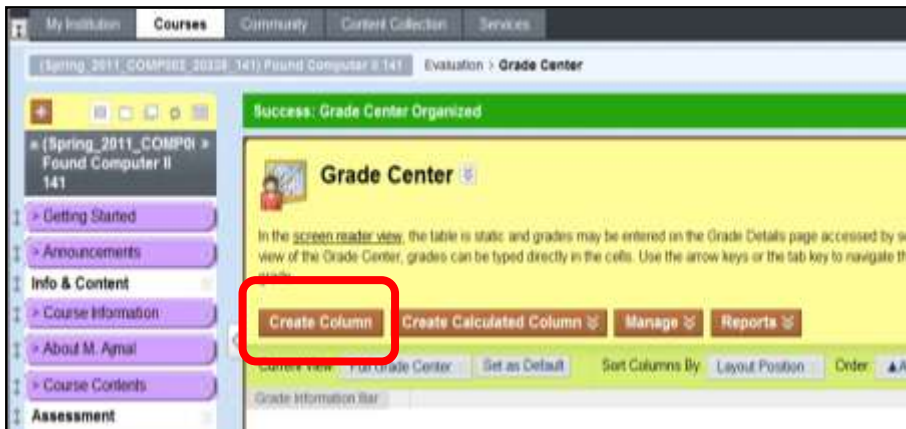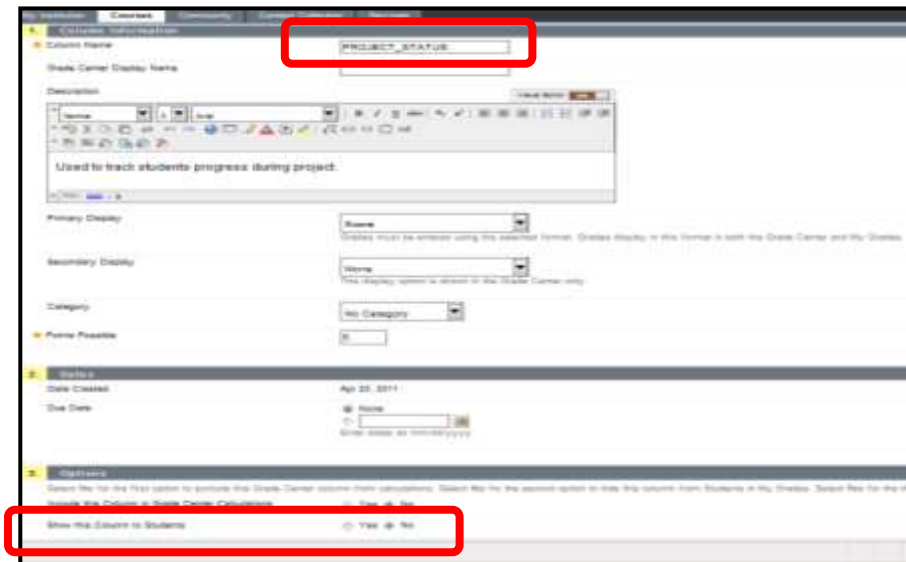

Figure 3: Creating Project_Status Column (Grade Center)

Figure 4: Hiding Project_Status From Students

Step IV

At this point, the students can see ALL "Stages" items. Since it is required to limit their view to only one "Stage", AR rule should now be applied to all the "Stages" Items created in Step II. The AR rule is based on the "Project_Status" grade defined in the previous step. For each "Stage" item, the "Project_Status" value is set equal to a unique value. In its simplest form for the AR rule, Project_Status is set equal to 1 for "Stage 1", Project_Status is set equal to 2 for "Stage 2", and so on (Figure 5).
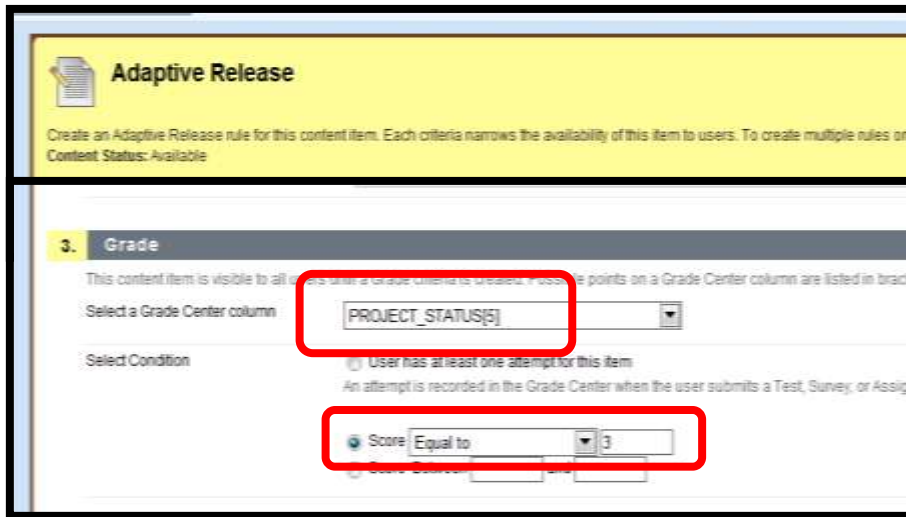

Figure 5: Applying Adaptive Release Rules On Stages Items

Step V

Finally, at the end of the project, the "Project_Status" value for all students should be set to 1. Thus, all students are set at the same level and can view only the "Stage 1" (Figure 6).
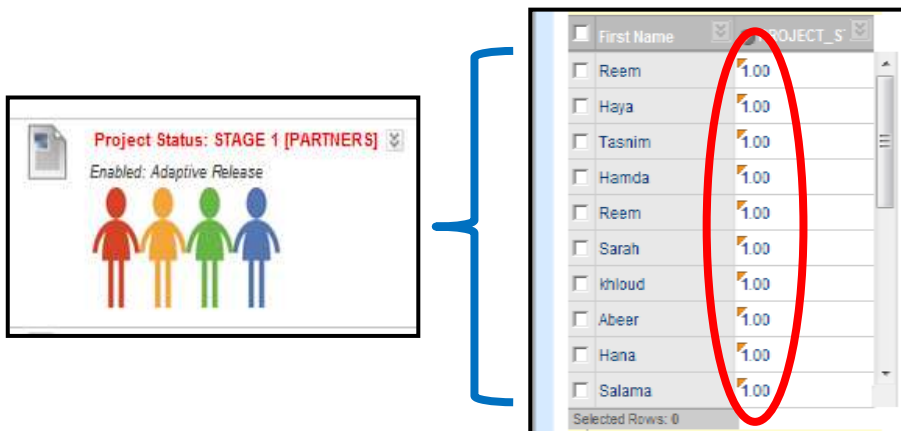

Figure 6: Setting Students To Initial Stage

5. Project Monitoring

The various groups of students move at different pace during the project lifetime. Each group has a restricted workspace in the Blackboard course which the students use to exchange ideas and documents and other artifacts. The students may view only one stage at any time and the instructions to complete that stage are also provided. When any group has completed their tasks related to a stage, the students inform the teacher. The teacher verifies that the stage is in fact complete. On confirmation, the teacher promotes all students in that group to the next stage.

The promotion is accomplished by editing the "Project_Status" grade in the Grade Center (Figure 7). The figure shows that student Maryam is now in "Stage 2" after this promotion.

Promotion stops at the final stage when the project is completed.

Figure 7: Promoting Students To Next Stage

This strategy encourages the students to work in discipline within the prescribed workspace abiding by the guidelines set out and to leave trace of their work and interaction. The teacher uses their workspace to access information to better help them. As an example, the "Project_Status" grade gives a precise and clear view of all students' progress and offers vital clues to many of the concerns mentioned earlier (Figure 8).

Figure 8: "Project_Status" Grade In Grade Center

6. Observations and Feedback

This framework offers solutions to the various challenges in a project assignment when critical decisions are taken. Its implementation and use results in overall benefit in terms of time and efficiency to both parties, teachers and students. Students know exactly what is expected from them at any point in time because they focus on only one stage of the project with precise instructions. Thus, they are less confused. They are also highly motivated to use this framework within their confined workspace for better collaboration and exchange. And, more important, the students know how this helps their teacher to provide the best guidance to them in return. The most obvious advantage for the teachers is now, they have more control on the way the students are completing the project and they also have access to information and artifacts that prove vital when monitoring the students, work. The teachers also find the framework to be relatively simple to implement and use; it is a single focal point for managing the project.

There may be additional benefits when using this approach. When managing the same project assignment in different classes, the performance of students in all the various classes (in different Blackboard groups) can be compared using the average "Project_Status" grade of the different classes.

7. Conclusion and Future Work

To face challenges in a project assignment, an approach has been proposed. A framework to support this approach is elaborated and implemented in a specific LMS. The feedback received from teachers and students is very positive and encouraging. It serves as a useful project repository that contains clues for important decisions. It saves time and improves satisfaction and efficiency.

The implementation described in this paper is based on a linear model i.e., moving from "Stage 1" to "Stage 2" then to "Stage 3" and so on until the final stage is reached. Other models may be more complex. As an example, it may happen that a group has to be demoted to a lower stage for some reason. However, this framework is believed to so resilient that it can be easily adapted for even those more complex models.

In educational institutions, LMS is used mainly by faculty members. To manage projects in these institutions, administrators usually prefer project management tools. However, it would be interesting to investigate how they can still make use of this framework in an LMS such as Blackboard to complement their project management tasks.

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