

Administration and Results of Extra Credit Projects

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Abstract:

This paper discusses an extra credit project from the educator's perspective for students in the Computer Technology Department at Purdue University (IUPUI). The paper discusses both the administration of the project and the results obtained by the students.

Students in two courses in the Computer Technology program were offered the chance to do a project for extra credit. The entire extra credit process was administered outside of the scheduled time of the course: students were required to obtain the project requirements from the instructor during office hours, identify a customer for their project, submit a proposal to the customer, obtain an acceptance letter, and deliver results that were complex enough to be useful to the customer, while modest enough to be completed in a four to six week period. The customer could not be the course instructor, but could be the department, a campus group or organization, or another instructor.

This project requirements were based on real world examples of project management, where a project team would submit a project proposal to a customer, identify the customer needs and work with the customer to deliver satisfactory results within any cost or time constraints.

The projects proposed by the students primarily involved the design and implementation of Web pages for various customers. While Web page design is a required skill for students in Computer Technology, this project offered the opportunity for students to implement a design for an outside customer as part of their educational experience; a skill that will most likely be necessary in future employment. This project offered students the opportunity to perform as a member of a real world project team, with the advantage of being in an academic environment, where assistance can be found if needed.

Introduction:

Students in two courses in the Computer Technology program were offered the chance to propose and design a project for extra credit towards their final grade in these courses. Both of the courses, *Assembly Language for Microprocessors* and *Operating Systems I*, were taught by the same instructor. The students were given the project requirements approximately mid-semester. They were told that any extra credit earned would be in addition to their regular assignments, quizzes, labs, and exams, and that those students who chose not to participate

would not be penalized. The grade distribution for the course was calculated prior to the addition of extra credit points.

The Assignment:

The project was intended to be comparable to a project assignment in a workplace. The typical project starts as an idea, and after an assignment to an individual or group, the participants decide on a plan of action which meets the criteria specified to accomplish the goal of the project, and works within any constraints placed upon the individual or group. This technique differs from a standard scholastic assignment or lab in that the outcome of different groups need not be similar, and that the specific goals of different projects are not given to the student.

The students were given the following requirements:

- All work on this project was to be completed and discussed outside of class time. Because this was strictly extra credit, it was not to interfere in any way with required assignments. The instructor was available during office hours if there were questions or problems.
- The students were given the option to work individually or in groups.
- The students were required to identify a customer for their project. The customer should be an individual, group, organization, or department that has a need that the students can address. The course instructor was not an appropriate customer, since the work was to be entirely in addition to the work required in class.
- Once the customer was identified, the student or group was required to submit a written project proposal describing the project in detail, as well specifying the customer, discussing which students were in the group and what skills each individual added to the group, and presenting a milestone list and/or timeline. This was to be presented to the customer for their approval, with a copy forwarded to the instructor.
- The proposal submitted to the instructor was to be accompanied by individual application letters stating the goal of each student participating in the project.
- While attendance was not normally mandatory, all students who were pursuing extra credit were required to attend lecture. This was to enforce the idea that the work was to be done outside of class time, rather than during or instead of required class activities.

Once the student or group received an acceptance to their proposal from their customer, they were expected to begin their work. There were no specific requirements on status reporting or meeting with the instructor through the course of the project. The entire grade was based on the final presentation to the customer and customer feedback.

Customer feedback was one important difference between this project and an industry project.

While any group involved in a project should seek customer feedback to evaluate their performance, the feedback is not usually directed toward the supervisor of the group. The direction of feedback toward the instructor was effective because the projects were in an academic environment, where the foremost goal is educating the student. Since the customer and the instructor share the same overall goal, they were able to discuss the progress of the group or individual students, if desired.

Approximately one-third of a total of 80 students inquired about the project, and approximately 25 students followed through to some extent. Seven projects involving 15 students eventually were completed.

Project Examples:

Two of the most successful projects were very similar in scope and accomplishment. Both of these were done by individual students for professors in other departments. The students sought professors from other departments that needed Web pages developed, and both succeeded with excellent evaluations from their customers. Both of these students accomplished all of the goals set out for the project - they sought customers, established project plans that met the needs of the customer and were able to complete in the six to eight week time frame given, and delivered on all of the planned objectives.

One of the projects failed to meet almost all of the stated objectives through the duration of the project. This project proved to be the most difficult to administer through the semester. This project, proposed by an individual student, was to design an on-line study guide for the class. It was originally proposed that this student would put quiz questions, exam questions, and notes from both lecture and the text on the Web for students to use as a study guide. This project, as stated, would meet the guidelines for the project. However, the student's accomplishments were as follows:

- *Identify the customer:* This student initially tried to identify the instructor as the customer before finally heeding the recommendation of the instructor not to do so. The student eventually chose "the class" as the customer. However, the selection of the entire class introduced a number of problems for the student:
 - In this case, the customer feedback to the student and the instructor would need to come from the class, or a representative of the class. This could prove to be difficult.
 - Since the project would not be ready until the end of the semester, the customer was changed slightly from "the class" to "next semester's class". This choice leaves two sources for feedback: the instructor or a representative from the current class.

Both of these problems lead to the same conclusion: soliciting customer feedback would be difficult for this project. However, no feedback at all was sought by the student on this project.

- *Application Letter and Statement of Proposal:* Both were turned in late. Also, the stated

reason for the task was “to raise my grade”; the only reason explicitly given to students as unacceptable.

- *The Project:* The student routinely skipped lecture and did not complete assignments to work on the extra credit project, although lecture attendance was required for extra credit participants.
- *Final Report:* The final project also failed to meet some of the minimum requirements. Among these:
 - The project was never implemented as a Web page. The student handed in printouts of hypertext markup language (html) code.
 - The required paperwork was not submitted. The report did not contain the proposal, application letter, any results, any customer feedback or independent evaluation.

This project repeatedly failed to meet the requirements spelled out for the assignment, and the extra credit given to this student did not affect this student’s final grade in the class.

Two of the projects were done for a customer in the Electrical Engineering Technology Department. There were two distinct needs affiliated with this customer. The first need was for Web pages to promote a mobile manufacturing laboratory used primarily by K-12 programs, to be linked to and from the main EET Web pages. These were fairly straightforward pages with some artwork, text, links, forms to supply and request information, etc. The other pages were to be interactive pages strictly for use inside of the laboratory. These were to have capabilities for use in instruction and troubleshooting for each piece of equipment within the trailer. Since bandwidth was not a significant limitation for these pages, the design team was free to use video, audio, or any technique they wished.

These groups faced unexpected problems with the laboratory itself which impeded their ability to deliver on all of the goals specified. This experience should prove to be an advantage for the members of these groups in the future. Typically, if unanticipated problems occur in scholastic life, the problems are dealt with by the instructor or the requirements are changed to minimize the impact on the education of the student. In this case, the groups had to respond to the customer while dealing with the laboratory’s hardware problems. The customer in both of these cases intentionally did not give the student groups much guidance. Instead, their instructions were to deliver what they could given the constraints they were facing.

The group designing the promotional Web pages came through with a design that the customer was satisfied with. The pages consisted of general and historic information, and had a form to request further information. The pages were put on the Web, and looked very attractive and functional. This group had one or two students who were basically unfamiliar with Web page design and construction, and one or two members who were uncomfortable in dealing with a customer. This is understandable as it is the first time most of the students had dealt with an external customer. Dealing with customers was probably the single most valuable experience for the students.

The other group had an excellent team leader who was very motivated, dynamic, and had very high expectations for the success of the group. Unfortunately, the leader seemed to rely on other members of the group who's expectations were not as high, and the product delivered was not very impressive. This group, especially those in the group who did the majority of the work, gained some valuable experience in working in a team environment where everyone does not necessarily strive to reach the same level.

Administration of the Projects:

Administering most of the projects was actually not very time consuming until the final reports were turned in. Since most of the interaction was between the students and their customers, the instructor was not involved in most of the process. Some of the lessons that were learned through this semester included:

Valuable lessons:

- An extra credit assignment should stipulate that all work must be done outside of class. Students may tend to become involved in the extra credit project to the neglect the course requirements. Additionally, requiring attendance in class will show the students that the requirements of the course still apply.
- The importance of customer feedback cannot be emphasized enough. While students receive grades as a measure of their performance in school, their performance in the workplace will most likely be evaluated via customer feedback, whether the customer is an outside customer, their supervisor, or their peers.
- For a project to be truly extra credit, the students who do not participate must not be penalized. Therefore, the final grades for the students must be figured prior to the application of the points for the extra credit. If the points are added in prior to grading, students on a borderline may be pushed down due to the extra credit of a classmate. In this situation, the class average was raised from a 2.7 to a 3.2 after applying the extra credit points, and the grades for all students that did not participate were not affected by the extra credit.

Should be done differently:

- In the future, there will be a decision point upon receipt of the proposals. Since this was not in place this semester, one project was completed that failed to meet the minimum requirements. The instructor spoke with this student through the course of the project, and although the student was informed that the minimum requirements were not met, the project continued. A firm acceptance/denial step should help prevent this in the future.
- The project should be assigned early in the semester. This, combined with a firm application deadline, would prevent the steady flow of questions asking for acceptance of a project as the semester comes to a close.

- Student feedback and grading methods should be worked out prior to the receipt of the final reports. The instructor should decide how the projects are to be graded and how the grades and feedback are to get to the student. It is important to get feedback to the student, as this is an educational experience for them. Without feedback, it becomes just another assignment rather than an opportunity to learn something outside of the classroom.

Conclusion:

Extra credit projects offer the students the opportunity to deal with situations they otherwise may not encounter until they move into the workplace. Companies are looking for graduates that can function in a team environment, that have the ability to think and solve problems independently, and that have an understanding of why a particular solution should be implemented rather than a simple memorization of possible solutions. In the performance of this project for an outside customer, the students experienced dealing with customers without a previously defined goal to strive for. In addition, students gained experience in writing formal proposals and final project reports.

Of course, extra credit projects mean additional work for the instructor, as well as the professors, organizations, or departments who serve as the customer. The customers will have had a need addressed at the conclusion of the process, so the additional work may be a small price to pay for them. Before offering students the opportunity of extra credit, an instructor must be prepared to express to the students that this work is in addition to the requirements of the course, and not to replace required work. If you are willing to take the additional workload, extra credit projects can add a tremendous amount to the collegiate career of your students, and can expose them to problems and opportunities they may not see until they enter the workplace. This should make them better prepared after graduation, which should be one of our primary goals.

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