Evaluating Group Projects: A Web-based Assessment System

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Abstract

Proper evaluations of group projects can be a time consuming process. Even under ideal circumstances, when the evaluation process can be spread across the lifetime of the project, the completed project evaluation is usually a crucial element in the grade the student receives for the course.

With a little planning and online computer access during the formal presentation of a project, much of this final evaluation can be performed as a function of the project itself – using peer and team evaluation in addition to the customary instructor's evaluation. By implementing the assessment in a web-based format, assessment data can be gathered and processed automatically, significantly reducing the overall assessment time. In this paper a review of the literature surrounding group project assessment will be explored along with examples of how a web-based assessment system can be used to enhance assessment strategy while reducing overall assessment time.

Introduction

According to Chen & Lou (2004), group projects are now a common pedagogical practice for most academics especially in business schools. Many academics view group projects as an excellent way to involve students in the learning process while at the same time enhancing important social skills necessary to work successfully with others. Assessing these group projects, on the other hand, has proven to be problematic (Lejk, Wyvill and Farrow, 1996). The purpose of this paper is to review the typical problems often encountered in the assessment of group projects and present the author's strategy for assessing group projects in an undergraduate level introductory computer.

The structure of this paper will be as follows. A brief look at problems in assessing group projects in general as encountered in previous literature will first be discussed. Alternatives to assessing group projects will be reviewed followed by a discussion of how peer assessment can be used in evaluating individual contributions within the group project. The author will then outline his assessment strategy and how it can be implemented to assess the group project he assigns in an introductory computer course. Finally, a brief overview of the author's assessment system will be discussed along with the results and future plans for improving the system.

Background in group assessment

Group project assessment can be approach from two opposite perspectives. One approach is to assess the contribution of each group member individually as defined by the project's requirements. While many students feel more comfortable with this approach since it acknowledges individual effort and quality of work, it does little to stress the importance of group skills such a collaboration, organization and cooperation. Each student's grade is determined by their contribution to the project with little, if any, assessment given to the group as a whole. Project assessments that rely only on individual components may suggest to students that collaborative teamwork is not really valued. (Freeman, NcKenzie, 2002) Implementation of this type of strategy may also place a heavy burden on the part of the academic.

The opposite approach is to assess the group project as a single entity, evaluating group members' work on the merits of the project based upon the project requirements and assigning the resulting grade to each of the group members. This approach is typically met with great resistance from the students, since it makes it possible for and may encourage a student to accept a grade with little if any contribution toward the project. This "free-rider" problem, also known as social loafing, is often the main cause of dissent for students when using this approach to assessment (Brooks, Ammons 2003) and is well documented in the literature (Mello, 1993; Williams, Beard, & Rymer, 1991). While this approach may require less work for the academic, it is often deemed unfair by students and may remove part of the incentive to produce creative and excellence work.

Generally speaking, assessment of group projects is a compromise between these two extremes. Part of the assessment may be based upon individual contribution and ability to work in the group while part is based upon team collaboration and the merits of the finished project. Many researchers believe applying appropriate weight to both the individual contribution and the group's collective achievement may be the best approach in addressing inequitable contributions effectively (Williams, Beard, & Rymer, 1991). Current research indicates peer assessment is an effective way to determine the individual's contribution to a project, since the students themselves are usually more familiar with group members' contributions than the academic (Chen & Lou, 2004). Applying both approaches with a single assessment strategy, students are more apt to consider the assessment tool as fair – an important criterion in any assessment strategy (Freeman & McKenzie, 2002).

Research on peer assessment as a part of group project evaluation

One way to assess individual contribution is by means of peer assessment. Group members are asked to assess (usually anonymously or confidentially) the individual contribution of each team member – either by percent of contribution or rank – and these assessments are then weighed by the academic in determining the individual grade of each team member. There have been numerous peer assessment strategies recommended by researchers in recent years for balancing the "fairness" factor for group projects. Goldfinch and Raeside (1990) suggested a two-part assessment form where students identified peers who made the greatest contribution and then ranked peers on multiple criterion related to team contributions.   A similar approach using task ratings was suggested by Conway (1993) and found to be regarded as fair by his students. Cheng and Warren (2000) noted that peer assessment using multiple criteria "facilitates the benefits of group work while providing opportunities for peer assessment".

More recent studies have compared the use of multiple criteria with a more holistic approach rating group members' contributions toward the project. Lejk and Wyvill (2001) found the holistic ratings had a higher inter-rater reliability when compared to multiple criteria ratings. However, they also noted the possibility of student collusion in the assessment process might occur more readily in the holistic approach. The research also indicated multiple methods of calculating and weighing various factors in converting these varying approaches in assessment into a final individual grade (Lejk & Wyvill, 1996). However, it is the opinion of the author that this should be expected since most of the research impacts a wide range of disciplines.

Designing a successful project assessment strategy

While every project possesses its own special merits and objectives that need to be evaluated in their own way, there are a number of standard practices suggested by the literature. Assuming the project and its objectives have been well-defined and specifically stated in the project description (crucial tasks to the development of a good assessment strategy), then goals of the assessment strategy are next to be developed. What should be evaluated and how it is evaluated are the next tasks to be completed (Valdez, 2003). Generally speaking, assessment strategies have multiple tasks to assess with varying weights attached to each and these should be determined, defined, and assessed by the academic for balance and alignment to the assessment goals. A common approach is to design an assessment rubric stating how specific tasks will be measured and weighed in respect to the final project grade (Kirkpatrick & Fuller, 2002). The type of assessment to be used for each task, for example – individual versus peer assessment – needs to be defined and clarified. Validation should be considered, if possible, based upon prior experience or less significant assignments.

Implementing an assessment strategy

Once an assessment strategy has been determined for a specific project, the implementation of the strategy may still be a problem. Depending upon the complexity of the assessment, an excellent assessment strategy may unfairly burden the academic resulting in either a failure to fully implement the assessment or a poor implementation of the assessment. SPARK (Self and Peer Assessment Resource Kit), a confidential web-based template for peer assessment of group projects is an example of one approach in implementing a group project assessment strategy (Freeman & McKenzie, 2002). The use of a web-based system to aid in the gathering and processing of the assessment strategy promotes the use of a more detailed strategy since data no longer needs to be gathered and analyzed by hand. It also enhances feedback to the student and provides the information in a more timely fashion than is possible by hand. Although a fair amount of time may be needed to create and support such a system (determined by the complexity of the assessment strategy), it can easily save the academic time and increase the accuracy of the assessment, especially when used in large classes with many groups.

An example – Assessing the final project in MS120

The Introduction to Computers course taught by the author is a required course for every student in the university's school of business. The primary objectives of the course focus on gathering, organizing, analyzing, and sharing information. The course utilization of both web technology and standard business applications provide the tools the students need to accomplish these objectives. The course's final project is a group project intended to pull together all aspects of the course as well as provide the students an opportunity to benefit from participating in a peer learning activity.

The project is to design and implement a small business website utilizing the skills and tools learned by the students throughout the course. Each team of four students develops a project plan and determines the type of business they wish to use in the project. Teams may select an existing company (after securing permission from the company) or create their own business, as often is the case. Many students utilize the small business plan they developed as the result of another group project in a parallel course – Introduction to Business. Team membership is determined by the author after assessing the results of an earlier project – a personal website – in an attempt to provide equality across all teams by insuring that each team consists of members proficient in certain skills that have been emphasized throughout the course. Team members work together during the last half of the semester on several smaller team assignments to enhance team interaction and create familiarity with the group assessment system prior to beginning work on the final project.

Specific project requirements include: designing and developing a small business website that accurately portrays the mission of their business; the use of forms for information gathering and customer support; database accessibility; the use of web pages developed in Excel; a site map; and site search capabilities. The web site can be developed using any web development tool or in plain HTML & ASP.   Students are given approximately six weeks to complete the project. Team organization and the development of a formal project plan are the responsibility of each team. Teams present their project to the class during the final class period of the semester as part of the project requirements.

Designing an assessment strategy for the project

Assessment of the project is performed in two separate parts. In the first part, Part I, each student is required to complete a confidential peer assessment using the course's website for each member of their team prior to the final presentation of their project to the class. This assessment allows each team member to define a percentage of each member's contribution to the project (including their own) and a description of that contribution. Each team is required to keep all documentation for the project (minutes at each team meeting and all emails pertaining to the project) in a shared folder tracking the progress of the project. The author uses the peer assessment and the team's documentation to determine the percentage of project points (0-100 percent) each team member will receive once their project has been evaluated.

In the second part, Part II, the author extends the use of peer assessment within a group perspective to help evaluate the project itself. Since much of the course has dealt with sharing information and e-commerce, the ability to determine what distinguishes an effective small business website from an ineffective one is an important part of each student's skill set. Utilizing these skills in a group perspective, each team project is evaluated by every other team and the author during the final class period.   Project presentations are done in the course's computer lab where each team is assigned a networked computer in order to assess each project during the presentation using the web-based assessment system.

Analysis of project assessment

The project assessment is worth 50 points and is weighted as follows:

1. Part I: Peer Assessment and team documentation (10 pts)
2. Part II: Basic Requirements (25 pts) – Analysis of project's requirements
3. Part II: Design Components (15 pts) – Analysis of the three design factors taught during the course – information, technology and presentation designs.
4. Part II: Comments (0 pts) – Each team is encouraged to offer constructive criticism concerning the outcome of the project. All comments and assessments are confidential.

Each team's project score (Part II) is determined by averaging all team assessments into a single class assessment and then averaging this result with the author's assessment (using the same assessment tool as the students). This has the effect of balancing the class' assessment with the author's assessment giving equal weight to both in the final assessment score. Historically, a comparison of the author's assessments with the students' assessments indicates that students have a tendency to grade the better projects more harshly while at the same being more lenient toward the weaker projects.

Additional project points include those awarded for peer assessments and project documentation. Peer assessment points are awarded individually (5 pts for completion) whereas documentation points (5 pts) are awarded to the group. Peer evaluation points are given to each student who completes the peer evaluation process and documentation points are given to each group depending upon the completeness of the documentation provided by the group. The primary purpose for these points is to provide motivation for each student to complete their peer evaluation and for the group to document their progress throughout the project.

Analysis of past results

Over the past five years, the author has utilized a version of this assessment system to evaluate the small business web site project in this course. By utilizing two simple forms accessible through the course web site, students have completed peer assessments of individual contributions and assessments of team projects with relative ease. Analysis of each assessment was originally performed entirely in Excel (by downloading the form results in simple text and importing them into a simple worksheet) and later transferred to an Access database for ease of analysis and reporting. Below is an example of the results from the author's most recent semester (Fall 2005). The effort in implementing such a system is minimal (originally done using MS FrontPage) yet the results are quick and accurate making assessment of this final project a pleasant task for all involved. Students receive constructive criticism on their project and their final project grades via the team's shared email folder prior to their departure from campus for the semester and are generally satisfied with the results.

Anticipated improvements to the system

As a result of studying the current literature and writing this paper, several changes will be made to the author's current assessment system. The latest revision for this web-based assessment system allows for individual assessment instead of team assessment for each project presented. Allowing each student to individually assess every project (except their own) will provide several advantages over the previous system. First, it should provide for a more accurate assessment of each group project since the assessment will now reflect individual opinion rather than group opinion. Second, it will provide an opportunity for the author to assess each student's skills and knowledge of web site assessment, a topic discussed throughout much of the course. Third, and perhaps most important from the assessment stand point, it will hold each student accountable for their individual assessment of each project by generating a separate grade for every student for their role in the project's assessment, thereby improving the validity of the assessment instrument.

Finally, to add a friendly competitive flair to the project (in an attempt to foster more professional and creative projects) the author will add a ranking process to be completed by each student after the individual project assessment is completed. This process will allow each student to rank the projects according to the quality of the project and not necessarily according to the project requirements. Final rankings (1..N) will be determined by averaging the total rankings for each project with the winning project accumulating the lowest averaged ranking. Points awarded for rankings and added to the final project score will be determined by assigning an A (10 pts) to the top third of the projects, a B (8.5 pts) to the middle third and a C- (7 pts) to the bottom third of all the projects presented.

Conclusion

Group project evaluation does not have to be a difficult and unpleasant task. By carefully designing an assessment strategy that compliments the objectives defining the project and with the use of peer assessment to address the fairness issue, group project assessments need no longer be a burden. Implementing the assessment strategy in a web-based environment reduces the workload for the academic, while at the same time increasing the thoroughness of the assessment and saves significant time in the gathering of assessment data. Implementing the assessment of a group project in this way can be thorough, quick, easy, and even fun to do.

References

Brook, C. and Ammons, J. (2003). Free Riding in Group Projects and the Effects of Timing, Frequency, and specificity of Criteria in Peer Assessments *Journal of Education for Business*, 78 no5 May/June 268-272.

Chen, Y. and Lou, H. (2004). Students' Perceptions of Peer Evaluation: An Expectancy Perspective. *Journal of Education for Business*, 79 no5 May/June 275-282.

Cheng, W. and Warren, M. (2000). Making a difference:using peers to assess individual students' contributions to a group project. *Teaching in Higher Education,* 5 (2) 243-255.

Conway, R., Kember, D., Sivan, A. and Wu, M. (1993). Peer Assessment of an individual's contribution to a group project. *Assessment and Evaluation in Higher Education* 18 (1) 45-56.

Freeman, M. & McKenzie, J. (2002). SPARK, a confidential web-based template for self and peer assessment of student teamwork; benefits of evaluating across different subjects. *British Journal of Educational Technology*, 33 (5) 551-569.

Goldfinch, J. & Raeside, R. (1990). Development of a peer assessment technique of obtaining individual marks on a group project. *Assessment and Evaluation in Higher Education* 5 (2) 21-31.

Kirkpatrick, D. & Fuller, R. (1995) reprinted: (2002). The Challenge of peer assessment, A Focus on Learning. *Proceedings of the 4th Annual Teaching Learning Forum*, Edith Cowan University, February 1995, 146-149.

Lejk, M., Wyvill, M., & Farrow, S. (1996). A survey of methods of deriving individual grades from group assessments. *Assessment and Evaluation in Higher Education* 21 (3) 267-280.

Lejk, M. & Wyvill, M. (2001). Peer assessment of contributions to a group project: a comparison of holistic and category-based approaches. *Assessment and Evaluation in Higher Education*, 26 (1) 61-72.

Mello, J. (1993). Improving individual member accountability in small work group settings. *Journal of Management Education,* 17(2) 253-259.

Valdez, G. (2003). Evaluation Design and Tools. North Central Regional Educational laboratory, http://www.ncrel.org/tandl/eval2.htm.

William, D., Beard, J., & Rymer,J. (1991). Team projects: Achieving their full potential. *Journal of Market Education.* 13, 43-45.