

Achieving an Effective and Successful IS Group Project

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Abstract

A group project plays an important role to train information systems (IS) students' skills in teamwork. However, an effective and successful group project is not straightforward. In this paper, we summarize some teaching tips to achieve an effective and successful group project. In the preparation stage, the instructor should choose a suitable topic and form a reasonable team. In the execution stage, the instructor should try to align the student's time-skewed behavior; in some circumstances, adjustment of topics and team members is needed. Students' separating the group project into several independent and isolated individual works should also be avoided. Additionally, some mechanisms are required to reduce the free-rider problem in a group project. In the assessment stage, the instructor should not only evaluate the overall project, but also accurately distinguish each member's contribution. In the post-assessment stage, revision of a group project, which is commonly ignored, should draw more attention from the instructor. We also discuss the importance of incorporating groupware into an IS group project and demonstrate several roles of groupware in an IS group project.

Keywords: teamwork, group project topic, free-rider problem, assessment, groupware

1. INTRODUCTION

Teamwork and virtual teamwork are becoming more and more important in IS professions (Pottert, Balthazardtt and Lee Elder 2000). Group projects, which can be used to train students' teamwork skills, have become an intrinsic part of coursework in information systems education (Steenkamp 2002). For example, introduction to information systems, system analysis and design, software engineering, and management information systems take group projects as an important element integrated in the course. There are numerous benefits for students learning via team or group projects (Lejk and Wyvill 1997). A group project, for instance, assigning each team to a college collaborative tool such as Blackboard, WebCT, etc, gives students a good chance to learn how to collaborate to perform a virtual group project. Some key research on the use of teamwork in information systems education includes Wojtkowski (1987), Keeler (1995), Fellers (1996), Menneche (1998), Van Slyke(1999), and Reif and Kruck (2001).

However, an effective and successful group project is not straightforward. In practice, many factors affect the

effectiveness of a group project. Bahli and Buyukkurt (2002) outline some determinants of group performance. In addition, some students' behavior in teamwork, such as the free-rider problem, reduces the quality of a group project. The purpose of the paper is to address several teaching tips to help the instructor achieve an effective and successful IS group project. We elaborate our delivery according to the sequential four stages: the instructor's preparation stage, the student's execution stage, the assessment stage and the post-assessment stage. In addition, we discuss the important role of groupware in an IS group project.

2. IN INSTRUCTOR'S PREPARATION STAGE

Choose Suitable Group Project Topics

The first step for a group project is that the instructor should pick up a suitable topic. Generally, a good group topic should include the following features (Reif and Kruck 2001): 1). A group project should require multitude of knowledge, skills and abilities, which means it is very difficult for an individual to accomplish such a group project. 2). A group project should create an environment where team members can effectively

collaborate, share knowledge and skill, and communicate so that the problem can be efficiently solved. 3). A group project might have a deadline, which implies that it is unusual for an individual to complete all of the necessary work before the deadline. The instructor should check carefully some potential topics, and choose those with all of the above three features. The instructor might choose one topic for the entire class, or different teams have different topics. One identical group project for the whole class has some advantages. For example, different groups can discuss and learn from each other and this encourages students to share knowledge. The downside of this approach is that some groups might collude and copy each other's works. One topic for one group has some advantage such as each group must work independently. The downside of it is that one team cannot easily discuss and learn from the other teams. Which approach should be used depends on the characteristics of topics and the instructor's teaching objective.

Form a Reasonable Team for Each Group

Chan (2002) demonstrates the importance of team formation. McCloskey (2004) gives a teaching tip for how to form effective teams for group projects in IS courses. The student more likely forms a team with his/her friends when he/she is asked to form a team by himself. The upside for this kind of team formation is that everyone knows each other very well, and it is easy for them to create a friendly team environment. The downside is that in reality, the team might be task-oriented, or team members might be pointed by the upper management. In this setting, a team member has less freedom to choose his/her partners. They must learn to work with new team members who they do not know very well. Besides, self-selected teams might be biased, which means one team might be full of top students, another team might be full of under-performed students. How should we form an effective and reasonable team? The instructor should involve assigning each team member. In order to train students to work with non-acquiescence and let all the teams be in the similar level, the instructor might conduct a survey and get to know each student's background. Some information systems classes might have students from different departments. For a group project about Enterprise Resource Planning, an effective and reasonable team should be composed of students from different business majors such as finance, accounting, marketing, etc. This kind of team formation highly mimics the real working team under the ERP environment, and a group project with such team memberships gives students a good chance to learn how different functions in an organization coordinate and collaborate to accomplish ERP teamwork.

3. IN STUDENT'S EXECUTION STAGE

Time-Skewed Behavior towards a Group project

Most teams can make progresses towards their group projects smoothly. However, some groups might choose

to start their works quite late, even just before the deadline. Conversely, other groups might try to finish the group projects in the first several days so that they can focus on other things later on. Generally, time-skewed behavior in a group project should not be encouraged. For the first case, it is difficult for the group to finish a high quality group project within a limited time. For the second case, rashly finished projects might also have a quality problem. At least, the group has some time to improve its work. So, the instructor needs to check the pace of each team's progress. One thing that the instructor can do is to ask each group to hand in progressive reports during the entire project period. Alternatively, he/she could randomly select several groups to check whether the students evenly put their efforts on the group projects. Penalty might be used to those teams who have no progress for a long period. In this way, students have an incentive to make progress smoothly and evenly.

Adjustment of Group Topics or Team Members

Sometimes it is difficult to know which topic is suitable for a group project until it is tried. If there are many problems existing for the current topic, or the instructor finds that it is difficult to achieve the teaching objective by sticking to the current topic, the instructor should suggest a new topic to the students. This means, while the instructor picks the group project topics, it is a good idea for him to prepare some back-ups. In the similar token, it is difficult to know which exact members should be used to form a reasonable team until the team is set up and see whether it is working effectively. Bahli and Buyukkurt (2002) define the roles of "group cohesion" and "group efficacy". Sometimes, if there are some critical problems existing in a team so that the team cannot accomplish the group project, the instructor should consider reforming a team. This adoptive and dynamic approach might interfere with the evaluation of group projects as the instructor needs to change the topic or re-shuffle the team members. The bottom line is that if the topic is found to be unsuitable or the team cannot work effectively, re-shuffling might be a better choice. In practice, the instructor might give each team a trial period and see whether any adjustment of topics or team members is required.

Group Project vs Individual Work

Admittedly, in order to accomplish a group project, we need labor divisions among team members. However, sometime, team members just split one group project into several independent and isolated sub-works, making each member only responsible for his/her own work without any coordination and cooperation. After each one finishes his/her job, the group might simply combine each individual work together as a group project. There are some problems with this kind of behavior. First of all, such student behavior is against the principal spirit of teamwork: students cannot learn how to coordinate and collaborate with each other. Second, their final work is segmented. Third, since each

team member only cares about his/her own work, he/she has no incentive to monitor anyone else's work. Each team member does not know the contribution of others. If this happens, it is difficult for the student to conduct a peer assessment for his/her team members. A suggested solution for the problem is as follows. The instructor should help students to divide and assign works to each member. The instructor might set up the following rule to force students to coordinate and monitor each other: several team meetings must be held to discuss the overall progress of the whole project (not individual work). The instructor also asks each team to elect a team leader, who plays a leadership role to coordinate and monitor each member's activities. To induce each team member to care about the overall quality of teamwork, the instructor can inform students that he/she will evaluate each member's work not only according to the quality of each student's "own" job, but also the quality of the "entire" project.

Free-rider Problem

There might be a free-rider problem in a group project (Bartlett 1995). Since in most cases all the students in a group will be assigned the same or similar grade, the marginal efforts of one student will benefit all the people in the group. But for the contributor, his/her marginal gain is only part of the total gains derived from his/her efforts. On the other hand, the people without any efforts can get some gains from other contributor's efforts. Therefore, it might be true that quite a few members want to be a free-rider, and few members are willing to contribute. To the extreme, a group project might be done by one individual student, and the overall quality of project will be poor. Our suggested solution is that a fair assessment of a group project is a very important approach to stimulate each member to work hard (Leach, Neutze and Zepke 2001). So, telling the students in advance that the instructor will distinguish each member's contribution to a group project will highly reduce the free-rider problem. We will discuss how to fairly assess each member's contribution to a group project in the next section.

4. IN INSTRUCTOR'S ASSESSMENT STAGE

The usual practice that the instructor reviews a project, and assigns the same grade to all the students in the group, unfortunately, leads to the free-rider problem mentioned above. This evaluation method eliminates the difference among the people in a group. Admittedly, even though everyone in the team does his/her best, their contributions to the group project are still different because of their backgrounds and intelligences. Conway and Kember (1993) points out that students complain that awarding the same mark to all group members is often not a fair evaluation of individual effort. Therefore, the instructor needs to distinguish each individual's contribution to a group project. However, there is an asymmetric information problem to the instructor. Although each member usually knows each

other's efforts in the group, for the instructor, each individual's effort is private information. Generally, there are two approaches for the instructor to get to know each individual's contribution. The first approach is that the instructor asks student to write logbooks which show the sequential progresses of a group project and the detailed descriptions of each member's activities. However, this approach needs the instructor's extra efforts to process the logbooks. The second approach is to ask the students to report the efforts of all people in the group, which we call a peer-and-self assessment. There are a number of studies about the peer assessment practices (Dochy, Segers and Sluijsmans 1999; Sluijsmans, Dochy and Moerkerke 1999; Falchikov and Goldfinch 2001; Sindre, Moody, Brasethvik and Solvberg 2003). However, a common problem with this approach is how to induce the student to tell the truth. A new mechanism for peer-and-self assessment under which telling the truth is a dominant strategy to each group member (Tu and Lu 2004) is one of potential solutions to free rider problems.

5. IN POST-ASSESSMENT STAGE

A complete group project should not end after the assessment. After the assessment, the instructor needs to help students understand the comments and help them to analyze how to improve their group project. This step is usually neglected, but it is very important in IS education. In many IS group projects, a high quality project might follow the systems development lifecycle (SDLC). So, asking students to re-do or revise their group projects is not redundant work, but a good chance to train them how to refine their work. The instructor needs to re-assess the revised project and give the team extra credits for any improvement so that students have incentives to put some efforts on revising their works.

6. USING GROUPWARE FOR GROUP PROJECTS

Groupware is software product that "supports groups of people who share a common task or goal and who collaborate on its accomplishment" (Turban, McLean and Wetherbe 2004). The common groupware products used by business firms include: Electronic Meeting Systems, Electronic Teleconferencing, RTC Tools (Interactive Whiteboards, Screen Sharing etc.) and Integration and Groupware Suites. The commonly used groupware at school is WebCT and GroupSystems. As more and more business firms are using groupware, IS students need to understand and know how to use groupware to conduct a group project. Martz, Shepherd and Hickey (2001) discuss how to use groupware in a classroom environment. Incorporating groupware into a group project is not only an important strategy to achieve an effective and successful team work, but also a requirement for IS professionals. The instructor needs to incorporate groupware into a group project and encourage students to use groupware for their group

projects as much as possible. Briefly, the application of groupware in a group project can be summarized as follows.

Convert teamwork to virtual teamwork. Web-based groupware lets students work together in different places or at different times. Consequently, groupware can create a virtual environment for the group members to meet and discuss through the Internet.

Electronic discussion. Group projects need communication, discussion, collaboration and coordination. Groupware supplies a standard platform for students to communicate, discuss, collaborate and share knowledge. The instructor can join their discussion, and answer students' various questions collectively, so that he/she can avoid too many individual discussions and individual responses to common questions.

Electronic monitoring. A group project needs every member's involvement and contribution. Groupware can track each team member's activities; therefore supply a powerful monitoring tool to the instructor. In order to encourage, even force students' participation and involvement in a group project, a rule like the minimum required time for group discussion through the groupware is acquired. Besides, groupware can record all the sequential activities, then, it is helpful for the instructor to trace students' discussion activities. All these are very helpful for the instructor to evaluate each student's contribution to their joint work.

Peer evaluation. Groupware also helps students to evaluate others' works. Open discussions and activities let each member know other members' contributions. Under the groupware environment, the peer assessment is more accurate as students get more information about each member's contribution. Besides, many groupware products have voting systems, allowing the instructor to use groupware evaluation systems and ask students to conduct online peer assessment directly.

7. CONCLUSIONS

Teamwork and virtual teamwork are becoming more and more important in IS professions. Group project plays an important role to train students' teamwork skills in IS education. However, an effective and successful group project is not straightforward. In this paper, we summarize a few teaching tips to help the instructor achieve an effective and successful group project. In the preparation stage, the instructor should choose a suitable topic and form a reasonable team for teamwork. In the students' execution stage, the instructor should check and correct students' time-skewed behavior for their group projects. In some circumstances, adjusting group project topics and team members is needed to confirm the teaching objective of a group project. Splitting a group project into several independent and isolated

individual works should be avoided as we want a group project as a real team work, not a simple summation of individual works. We point out the free-rider problem in a group project, and propose some solutions to reduce such a problem. In the assessment stage, the instructor should accurately distinguish each member's contribution. In the post-assessment stage, revision of a group project is required. Since groupware has become popular in the business world, we discuss the importance of incorporating groupware into students' group projects. We demonstrate that groupware can be used to create a virtual environment for a group project, to encourage students' participation, and to supply a powerful monitoring tool to both the instructor and students.

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