

Cooperative learning and decision-making in the classroom

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ABSTRACT

Business professionals recognize that teamwork is an essential skill and that there are numerous situations that require cooperation in achieving common goals. In order to prepare future professionals, educators implement strategies of cooperative learning to hone skills required for teamwork. However, individuals in groups do not automatically work harder, produce better products, nor learn more than those working alone (Gillies & Boyle, 2010; Kaye, 1992; Sharan, 2010).

Group members often show less motivation and application than those working alone, and satisfaction with the group and effort may be inversely correlated. Students who worked hardest may be the least satisfied (Hathorn, 2000). Evidence of this dissatisfaction can be seen in the low rates of students who strongly prefer cooperative over individual learning (Lindquist, 1995).

In the present study, 136 students participated in an experiment in which group problem solving and cooperative learning were examined. The results show that students did benefit from working in cooperative groups in that their investment decisions were significantly different from that of a naïve investor. However, students did not consistently reach the same decision as the group. The low effort students based their decisions on the group outcome, indicating social loafing whilst equal effort students were furthest from the group decision indicating a lack of support for the group findings.

Key words: Cooperative learning, decision-making, classroom, teamwork

INTRODUCTION

The ability to work in teams is demonstrated in sports, at work, in classrooms, and on The Apprentice. Educators in many disciplines, including those in accounting, have implemented the instructional strategies of cooperative learning and group problem-solving in the belief that these strategies lead to both improved learning and also the development of skills required to work in teams. However, these are two separate issues. The purpose of the present study was to evaluate the effectiveness of a group project, as well as the amount of learning that individuals experienced in the cooperative learning task.

LITERATURE REVIEW

Research on the effectiveness of group work has been mixed. Groups may work more efficiently at obtaining required information and exhibit more on-task behavior than individuals (Cavalier & Klein, 1998). Also, group members achieve higher grades than students working individually (Brush, 1997).

Despite these general findings, however, research indicates that collaborative group work is not equally effective in all situations. Individuals in groups often show less motivation and apply less effort (i.e., engage in more social loafing or free riding) than those working alone (Delucchi, 2007; Karau & Williams, 1993; Maiden & Perry, 2011). Not surprisingly, social loafing is more common in large groups rather than small groups and the effectiveness of the group decreases as the size increases (Lu, Yuan, & McLeod, 2012).

In addition, low achievers do not work well in collaborative settings with high achievers (Dillenbourg, Baker, Blaye, & O'Malley, 1996). It is a robust finding that brainstorming in groups is ineffective. Groups do not produce as many unique ideas as individuals, and people in groups tend to discuss common information rather than produce new information (for a complete discussion, please see Lu et al., 2012). Consequently, many students view group meetings as a waste of time (Kayes, Kayes, & Kolb, 2005).

Collaborative learning may lead to higher academic achievement, improved relationships, and better social skills (Johnson, Johnson, & Smith, 1998). However, learning is not equally effective in all situations (Gillies & Boyle, 2010; Kaye, 1992; Sharan, 2010). One reason for apparently contradictory results in research findings may be that average scores are measured across groups without regard to individual performance. When individuals in groups are assigned a project and individual grades are based on the project grade, individual learning is not being assessed. For example, cooperative learning does not lead to higher exam scores for individuals (Delucchi, 2007).

Research in accounting education has shown similar mixed results for cooperative learning. As all students who join study groups know, individuals in study groups learn material better than groups who only listen to the instructor (Hwang, Lui, & Tong, 2005). However, incentives to improve individual performance by combining individual and group assessment techniques are effective only under some circumstances (Maiden & Perry, 2012; Ravenscroft, Buckless, McCombs, & Zuckerman, 1995).

Clearly, in many groups, some individuals are benefiting more than others. Low achievers benefit from being in a group with hard working high achievers and raise their grades with little effort. Low ability students are tutored by high ability students and learn material and study strategies from them. Averages improve but not all participants in the group benefit to the

same degree. This can lead to resentment of group work (Hathorn & Ingram, 2002). Satisfaction with the group and effort may be inversely correlated. Those who enjoy working in a group are not necessarily the ones who did the most work. Those who worked the hardest may be the least satisfied (Hathorn, 2000). Student attitude to cooperative learning may depend on the method of assessment with free riders agreeing most strongly that they enjoy group work compared to high achievers who perceive grading based on group performance as unfair (Lindquist, 1995; Ravenscroft, Buckless, McCombs, & Zuckerman, 1997). Other studies, however, have indicated no significant difference in performance or attitudes of individuals versus groups (Cavalier & Klein, 1998; Lancaster & Strand, 2001).

The present study examined both the product of the group and individual learning in a cooperative project in an accounting class. Students were randomly assigned into groups of three or more. The group project required students to provide a detailed analysis of a company and to assess the investment potential of that company. Individual grades were based on the group outcome weighted by the contribution of individuals (as assessed by peers in the group). Students then answered a surprise final examination question on the company in order to assess how much they had learned about the company.

It was expected that students would demonstrate varying levels of expertise on the company in the final examination due to varying individual contributions to the project. It was also expected that high achieving students would identify the low achieving students since social loafing is often considered by high achieving students to be unfair. It was also hypothesized that groups of three would have less social loafing than larger groups (Lu et al., 2012).

METHOD

Participants

The participants in this study were 136 accounting students from Metropolitan State College of Denver who were randomly allocated to 29 groups of between three and seven members. Each group was required to analyze a publicly traded company as part of their class grade.

Materials and procedure

The final phase of the project required the group to analyze and determine the investment potential of the company that they had selected. The specific requirement was: "Based upon the information you've collected in the first three phases, assess the company's major strengths and weaknesses. You will likely want to address this analysis in terms of investment potential."

Since only the final project was graded, it was necessary to obtain a measure of the participation by each group member. Consequently, as a measure of the contribution to the group, each member was asked to distribute a sum of one hundred dollars to the group members (other than themselves) based on the contribution of the individual members. The distribution meant that any member allocated less than \$100 was viewed by others in the group as social loafing and conversely, all allocation above \$100 went to those seen as high achievers.

In order to assess individual learning students were given a surprise question in the final examination in which they were asked to distribute 50,000 dollars (in the proportion of their choosing) between the company that they had studied and a mutual fund. They were told that the

funds would be invested for a period of 10 years with no opportunity of withdrawing the funds. This question assessed how much students had learned about the long-term investment potential of the company. Students who engaged in social loafing and did not learn from the high achievers would be expected to invest as a naïve investor. There were 13 participants who did not complete this question and data from 124 participants was analyzed further.

RESULTS AND DISCUSSION

The mean of the investment amount that students allocated was compared to the expected investment amount that naïve investors would invest in the company. Naïve investors are individuals who allocate investments evenly between all the available options without regard to the potential future return and/or risk of the investment (e.g., see De Wit, 1998). This is known as the 1/n heuristic and there is ample evidence that individuals invest according to this naïve investment strategy (Benartzi & Thaler, 2001). Thus in our scenario a naïve investor would allocate 25,000 thousand dollars to the company and the mutual fund.

Of the 29 groups analyzed, 26 endorsed their companies as having strong investment potential and three groups determined that an investment in their companies was too risky. In the latter situation reverse scoring was used to determine the amount of the investment to be made in the company.

A one-sample t-test showed a significant difference between informed students (with a mean of \$29,191) and naïve investors (with a mean of \$25,000 based on the 1/n heuristic), $t(122) = 3.69$, $p < .001$. This result supports the hypothesis that there is some degree of cooperative learning taking place in the group setting. That is, individuals did endorse the group decision overall in that they suggested a significantly higher investment in the company than a naïve investor.

For participants from the three groups who did not endorse an investment in their analyzed company, a separate one-sample t-test showed a significant difference between the participants' mean of \$17,115 and zero, $t(12) = 2.05$, $p = .02$. This indicates that, although cooperative learning occurred, the level of decision-making was not high. Given that the groups had determined that the company they evaluated was not a worthwhile investment, then it would be economically rational for the group members to invest close to the entire amount of \$50,000 in the mutual fund and zero in the company.

The implications of whether the amount of individual effort and group size affect the mean amount invested in the companies chosen by the groups were also examined.

Individuals were further assigned to low, equal and high effort groups based on peer evaluations. Individuals were classified as low effort ($n = 42$) when peers allocated them less than 100 dollars, equal effort ($n = 25$) when peers allocated them exactly 100 dollars, and high effort ($n = 56$) when peers allocated them more than 100 dollars. Means of the amount invested in the companies were calculated for each effort category. A one-way ANOVA showed a significant difference between the three groups in the amount individuals were willing to invest in the companies $F(2, 120) = 5.271$, $p = .006$. Figure 1 shows that the mean investment \$20,800 for the equal effort group was significantly lower than the mean investment for the other two effort groups (means of \$30,810 and \$31,723 for the low and high effort groups respectively). This indicates that individuals in the equal effort group were less supportive of the group conclusion. The low effort group outcome was indicative of social loafing in that individuals in this group appeared to follow their group's conclusion. The high effort group appeared to be

confident of the group conclusion which is consistent with the fact that individuals in this group invested a proportionately greater amount of effort in the project.

Follow up analysis used a one-way ANOVA which showed no significant difference between the mean investment of the groups based on the number of students in each group, $F(4, 118) = 1.445, p = .224$. Figure 2 graphs the mean investment for each group size with the number of groups is shown in parentheses.

An analysis of group size on the effort of the individual group members found that less than 10 percent of the participants from the groups of three members were classified as low effort. This is significantly lower than the number of participants who were classified as low effort in the other groups – the percentages ranged from 28 to 40. These findings are consistent with the literature which has documented that the optimal group size is three members (Lu et al., 2012).

There is evidence of cooperative learning occurring in the groups with some level of individual informed decision-making. The low effort students base individual decisions on the group decision, indicating social loafing while the equal effort students were furthest from the group decision indicating a lack of support for the group findings. Prior research on social loafing was supported since there was an increase in social loafing in groups larger than three members.

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FIGURE 1.

Mean investment for each effort group.

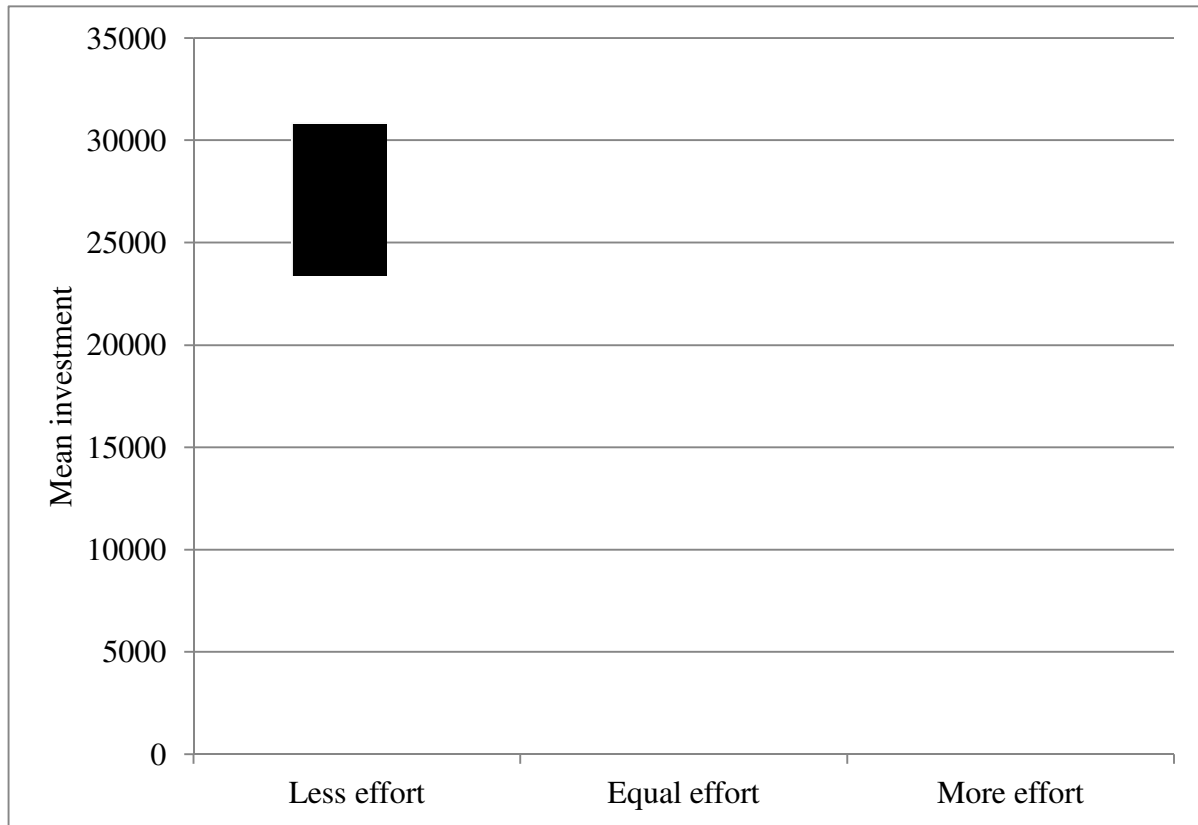


FIGURE 2.

Mean investment for each group size.

