Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 1997 Proceedings

Americas Conference on Information Systems (AMCIS)

8-15-1997

Building Student Teams: A Self-Managed Work Team (SMWT) Cooperative Learning Model

Carl J. Case
University of Pittsburgh at Bradford, cjc3+@pitt.edu

Follow this and additional works at: http://aisel.aisnet.org/amcis1997

Building Student Teams: A Self-Managed Work Team (SMWT) Cooperative Learning Model

Carl J. Case cjc3+@pitt.edu
University of Pittsburgh at Bradford

Abstract

This paper examines the team formation process which can be employed when utilizing group projects in information system (IS) classes. The paper presents a model for building team skills, creating positive interdependence, individual accountability, and group accountability, thus increasing team effectiveness. This model has been successfully employed in fifteen system analysis and design, software engineering, and business information system classes in which team projects were utilized.

Background

Information system (IS) faculty are perpetually challenged to develop a pedagogy which both enhance student learning and provide students with skills and knowledge required in the workplace. Cooperative learning utilizing self-managed work teams (SMWTs) may be key to achieving these goals. Cooperative learning is instruction that involves people working in teams to accomplish a common goal, under conditions that involve both positive interdependence and individual and group accountability (Smith, 1995). A SMWT is a team that is not hierarchical but driven by group consensus. Ultimately, teamwork ability is one of the primary qualities recruiters look for in the IS candidate in today's market (Kesselring, 1996).

Prior Research

Both cooperative learning and SMWTs have generated considerable interest within the research community. Van-Voorhis (1995) concluded cooperative learning structures generally yielded positive outcomes for students. Students' interest in the material, use of language in learning the material, and active pursuit of learning was enhanced by structured cooperative groups. McInerney (1996) found that for students undertaking computer skills courses, an instructional strategy which fosters development of self-regulation and peer support reduces anxiety and increases motivation by enhancing a sense of control and competence. Moreover, recent research has identified the role of team building in the software development process (Hefley, 1996) and resulted in development of a teamwork design model to assist in key decisions when using team projects in IS courses (Bento, 1995).

Studies have also illustrated growing interest in SMWTs (Yeatts, et al., 1994). More than 50 percent of FORTUNE 500 companies utilize SMWTs (Elmuti, 1996). Studies support a common belief that use of selfmanaged teams' programs generally improves organizational effectiveness (Elmuti, 1996) and can result in faster and better decisionmaking (Sirkin, 1993). In addition, Flanagan (1994) demonstrated that self-managed team participation led to improvement in employee productivity, efficiency, and quality.

Team Formation

SMWTs were systematically formed early in the semester. Teams were populated through use of student resumes. Students provided the professor with a one-page typewritten resume, identified solely by student social security number. Each student was informed he was using the resume to apply for a job and as a result, the resume should briefly describe what assets he brings to the team. The resume had required section titles for computer experience and education, business experience and education, rating of ability to coordinate (1=poor to 10=excellent), strongest team asset, and weakest team asset.

The professor selected students with highest self-rated "ability to coordinate" ratings to serve as team coordinators. Once coordinators were chosen, their resumes were removed from the pool. Remaining resumes were sequentially coded (A-Z or 1-n), photocopied, and distributed to team coordinators. Coordinators were given two days to study and order resumes from most to least desirable. The professor informed coordinators that diversity of skills would result in a more effective team.

Next, coordinators chose their team members during a randomized draft session. During the selection process, names were kept anonymous and draft choices were identified using assigned codes. Team size was limited between three and five members. Upon completion of the selection process, all resumes were destroyed and the professor randomly read team lists. The systematic formation process served to distribute skills between teams and provide the professor with a general student background. Resume information was used in determining optimum semester team projects.

Introduction to Teams

To promote positive team behavior, five steps were employed. These procedures introduced communication, decision making, and collaboration concepts. Concepts were interactively applied and demonstrated in a group setting.

Step one is used to set a benchmark which will be analyzed in step four. In step one, each student performs a survival exercise individually. Survival exercises, such as Winter Survival, Lost at Sea, and Lost on the Moon, are used because they generally illustrate weaknesses of individual decision making. Students are instructed to quietly rank items for survival and to not discuss their choices with any other class members.

Step two is utilized to improve communication skills. Handouts are provided which detail how to send and receive messages effectively. Three basic requirements for sending a message are to phrase the message so it may be comprehended, have credibility as a sender, and ask for feedback (Johnson and Johnson, 1994). Receiving skills include paraphrasing, checking one's perception of sender feelings, and negotiating for meaning. Role play was employed to illustrate concept application.

Step three is used to enhance group decision making. Factors enhancing effective group decision making include positive interdependence, individual and group accountability, face-to-face promotive interaction, collaborative skills, and group processing (Smith, 1995). Factors hampering effective group decision making include social loafing, inappropriate group size, conflicting goals of group members, lack of sufficient time, and so on (Johnson and Johnson, 1994).

In addition, this step describes advantages and disadvantages of seven methods of group decision making. These methods include decision by authority without discussion, expert member, average of members' opinions, decision by authority after discussion, majority control, minority control, and consensus. A primary objective of step three is to introduce students to consensus, a critical factor in "effective" group decision making.

In step four, students repeat the exercise from step one. However, students are instructed to position themselves with their teams and use consensus to order the list. One decision form is distributed to each team. Students are instructed that each item must be agreed upon before it becomes part of the group decision. In addition, students should avoid arguing blindly, avoid changing their mind just to reach agreement and avoid conflict, seek out difference of opinion, and avoid conflict-reducing procedures such as majority voting and tossing a coin.

When all teams have completed the ranking, the solution is read and scores are calculated. During debriefing, individual and teams scores are detailed, ranked, and averaged on the chalk board. Discussion issues include: how well the group used its resources, what factors caused the group to use its resources well or poorly, and exercise implications. Historically, I have found group scores are generally better than individual scores. As a result, the "team" concept increases in credibility among students.

Step five is used to illustrate group dynamics and process. One team is chosen at random to be in "the fishbowl," a circle formed at the classroom center. Other teams serve as observers and are quietly given instructions to monitor the fishbowl team. The observer will either monitor direction of communication, quantity of communication, or social-emotional/task behavior of a fishbowl member. Emotional/task behavior is measured using Bales' System of Categories Used in Observation instrument (1950). The 12 categories include shows solidarity, shows tension release, withdraws, shows antagonism, and so on.

The fishbowl team is instructed to perform a simple five-minute task (e.g., decide, as a group, how to spend $1,000). Observers use paper and pencil to detail group communication and decision process.

Once consensus is achieved, observer results are presented. The purpose of the fishbowl exercise is to identify strengths and weaknesses within the group's processes. Discussion issues include: who dominated discussion, what positive behaviors were evident, who did not talk to whom, and so on.

Upon completion of the five steps, students are presented with their semester team project requirements.

Students are strongly encouraged to apply the communication and consensus-building skills that they have just learned.

Enhancing Effectiveness

The key concepts related to cooperative learning and enhanced decision effectiveness are positive interdependence, individual and group accountability, face-to-face promotive interaction, teamwork skills, and group processing (Smith, 1994). Positive interdependence is achieved by giving all team members the same semester project grade and by structuring the project so that a variety of abilities are necessary for successful project completion. Individual accountability is increased by permitting each team member, near semester termination, to grade other team members' contributions. These grades are a component of the final average. Promotive face-to-face interaction is strongly encouraged but is difficult to enforce. Teamwork skills and group processing are presented during the five step process.

One additional tool provided the team is power to dismiss team members. Teams members can only use this ability in extreme circumstances. Before a member can be dismissed, the team must have a meeting with the professor in which problem(s) and solution(s) are discussed and the member in question is given another opportunity. If the member does not resolve the problem, the member may be dismissed. Dismissed members complete semester projects individually.

Conclusion

The five step model has been employed to build effective teams in 15 classes. Students' written evaluations, verbal anecdotal feedback, and lack of complaints indicate that this process is successful in providing IS students with the conceptual information and skills needed to perform effectively in a group environment.

References

Bales, R. "Interaction Process Analysis," Reading, MA: Addison-Wesley, 1950.

Bento, R. F. "Making Teamwork Work in the IS Classroom," Proceedings of the 1st Americas Conference on Information Systems, Pittsburgh, PA, August 25-27, 1995, 609-611.

Elmuti, D. "Sustaining high performance through selfmanaged work teams," Industrial Management 38.2, MarchApril 1996, 4-8.

Flanagan, Patrick, "IBM One Day, Lexmark the Next," Management Review, January 1994.

Hefley, W. E. "Where Does Team Building Fit As A Component of Mature Software Development Processes?" Proceedings of the Americas Conference of Information Systems, Phoenix, AZ, August 16-18, 1996, 449-451.

Johnson, D. W. and F. P. Johnson. "Joining Together," 4th Edition, Prentice-Hall, Englewood Cliffs, NJ, 1991.

Kesselring, D. "The Perfect IS Candidate," Job Choices in Science and Engineering , 1996, 23-24.

McInerney, V. "Students' Attitudes towards Cooperative, SelfRegulated Learning versus Teacher Directed Instruction in a Computer Training Course: A Qualitative Study," Presented at Annual Meeting of American Educational Research Association, New York, NY, April 812, 1996.

Sirkin, Harold Laurence, "The Employee Empowerment Scam," Industry Week, October 18, 1993.

Smith, K. A. "Cooperation in the College Classroom," working paper, University of Minnesota, Spring 1995.

VanVoorhis, J. "Implementing Cooperative Structures To Increase Motivation and Learning in the College Classroom," Presented at Lilly Conference on College Teaching, Columbia, SC, June 24, 1995.

Yeatts, D. E., M. Hipskind, and D. Barnes. "Lessons learned from selfmanaged work teams," Business Horizons 37.4, JulyAugust 1994, 11-18.