Team Process Check

Definition

A team is a small group of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable.[1] Although student teams may not satisfy all the requirements of the definition, the degree to which they do often determines their effectiveness.

Introduction

Teamwork has become an integral part of many undergraduate engineering curricula. Teamwork is highly valued by employers, facilitates active and collaborative learning, helps build community among engineering students, and is an outcome required for program accreditation. This paper describes the team process check, a teaming assessment instrument developed through the Foundation Coalition, and illustrates its use at three schools: the University of Massachusetts Dartmouth, Texas A&M University, and Arizona State University.

What is the Team Process Check?

The team process check (TPC) serves as a self-report assessment of a team's functioning to be administered periodically during the life of a team. The TPC aims to assess several areas of functioning such as communication, task management, decision-making, and conflict resolution. The instrument is a twenty-item scale to which students respond by using five-point ratings. The TPC has demonstrated good internal consistency and has yielded two meaningful factors, one that assesses what may be termed the team's sense of ability to get the job done well and the other related to interpersonal relations including communication and conflict resolution.

The TPC is intended to raise students' awareness of important team behaviors and to foster the process of self-appraisal necessary for continuous improvement. The instrument can be used to highlight areas of relative strength and weakness and can provide feedback on two overarching dimensions of team functioning (sense of ability and interpersonal relations) for the students and the faculty members. Student teams can make comparisons between their own team scores and class averages and can use self-assessments as a basis for generating improvement plans. To help others see how they might use the TPC in working with student teams on their campus, reports from three different institutions have been included:

- University of Massachusetts Dartmouth (UMD)

- Texas A&M University (TAMU)

- Arizona State University (ASU)

Ideally, this instrument can be used as a foundation for a structured conversation about the team's current functioning and pathways to improvement.

The TPC can be administered on paper or on the Web. Students can report on the functioning of the team as a whole or on their own team behavior and the behavior of their team peers. Team training material may be used as a companion to the TPC as a way of providing a meaningful context from which students can self-assess their team's functioning. Team training material can be found on either the Foundation Coalition Web site (http://www.foundationcoalition.org/teams) or a site constructed at UMD (http://www.fcae.umassd.edu/fcteam/teamtraining/frames_index.html; e-mail Ted Powers, tpowers@UMassD.Edu, for username and password). The team assessment process should be incorporated into the structure of the class, and some percentage of the students' grades should be allocated to teaming to encourage students to seriously engage in the assessment process.

University of Massachusetts Dartmouth

A number of studies using the Team Process Check have been conducted or are unde rway at the UMD. UMD faculty members used the instrument with classes of freshmen, sophomores, juniors, and seniors.

Recent studies at UMD established the validity of the TPC by correlating it with several alternate measures of team functioning. For example, the TPC was found to be correlated with faculty ratings of teams and with another measure of team process, the Team Behavior Checklist, developed by Dominick et al.[2] UMD faculty members found that teams consistently reported significantly lower scores for sense of ability than for interpersonal relations, suggesting the need to focus on these areas for improvement. Based on their findings, UMD faculty members believe that occasional meetings between faculty members and teams may improve team function. The TPC may be used to direct discussions during these meetings. In this manner, the TPC provides an opportunity for intervention and continuous improvement. Detailed information about this study is available.[3]

In a new study, faculty members at UMD are using the TPC to assess team functioning and to generate improvement plans to address areas of weakness. The functioning of assessed teams is being compared to that of teams who do not engage in this assessment and improvement process. UMD also will code the types of improvement plans that are generated and explore the potential relationship of different types of plans to outcome. To further validate the TPC, videotapes of teams engaged in a design task are being examined, and TPC self-reports of team functioning will be compared to the ratings of observers coding these videos. This study will be reported.[4]

Texas A&M University

The TPC was used in the second semester of a two-semester senior capstone design course at TAMU. The TPC was used as a tool to help a discordant team openly address internal problems. Team members were introduced to the TPC, and each item in the TPC was discussed by team members to arrive at mutually-agreeable understandings of its meaning. Team members then completed the TPC and submitted their completed instruments to a mediating professor who was not their instructor that term. Completed instruments were sent to the TAMU College of Engineering Assessment and Evaluation Office for data entry, analysis, and summary. Results were summarized and returned to the mediating professor. The mediating professor reported that the group decision to use the TPC, experience of group review, and discussion prior to completing the TPC had a positive effect on the group. In addition, several team members expressed satisfaction with the discussion process.

Arizona State University

Faculty members at ASU used an earlier version of the TPC to examine how a teaming learning component impacted female engineering students. Research revealed gender differences and identified innovative teaming practices that empowered students and provided a more equitable learning environment for female students.

In 1997–98 freshmen responded to a survey that gained attitudinal data on teaming practices. The results (Fig. 1) indicated that females felt less strongly about virtually every aspect of teaming in the classroom. Females in 1997–98 felt that faculty members were not providing adequate team training and were less likely to agree that faculty were monitoring and assessing their team's performance. In response to this, two formal strategies were implemented during 1998–99 to help improve female teaming responses: adoption of the TPC and "Team Time." The TPC was administered to students, and results were used at meetings between the team and instructor. The process allowed students to collect data on how their team was functioning, enabled faculty to review student concerns and issues, and used feedback to facilitate team performance. Team Time, a designated time period outside of class, allowed time for formal team training, provided time to work in teams, and enabled faculty members to monitor team performance and formally meet with teams to discuss team issues or concerns.

In 1998–99, students felt more strongly that faculty monitored and assessed their teaming skills compared to 1997–98. In fact, student perceptions associated with monitoring their teaming skills were higher in 1998–99 than in any other academic year at ASU. Female responses not only were more positive, they exceeded the males' on all teaming questions in 1998–99 (Fig. 2). Because instructors adopted the teaming assessment, females felt that a process was adopted through which they could voice their teaming concerns. The TPC was regarded as an "insurance policy" in the event a crisis occurred and often prevented problems before they escalated.

1997-98 Gender Analysis

Figure 1

1998-99 Gender Analysis
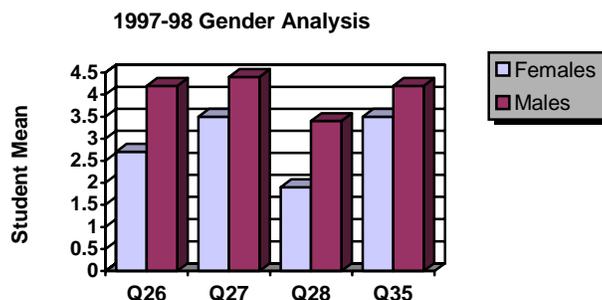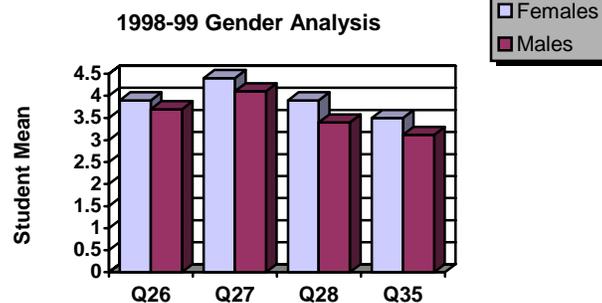

Figure 2

Survey questions:

Q26 I received formal instruction on basic team skills

Q27 I was assigned to work in groups on a regular basis

Q28 My instructors monitored and assessed my teaming skills

Q35 Working in assigned teams helped me understand the material presented in class

References for further information

1. Katzenbach, J.R., and Smith, D.K., 1992. *Wisdom of Teams.* Boston (Harvard Business School Press).

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3. Powers, T.A., Sims-Knight, J., Topciu, R.A., and Haden, S.A. (2002). Assessing team functioning in engineering education. *Proceed. Am. Soc. Engr. Ed. Ann. Conf.,* Montreal.

4. Powers, T.A., Upchurch, R., and Stokes, S. (2003). Using assessment to improve team functioning in engineering education. To be presented at the *Frontiers in Education Conference,* Boulder.

5. Sims-Knight, J., Upchurch, R., Haden, S.A., and Topciu, R.A. (2002). Teams in software engineering education. *Proceed., Frontiers in Ed. Conf.,* Boston.