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# Workshop - Building Reflective Team Skills with a T-Group

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**Abstract** - ABET criteria require that engineering graduates have the ability to “function on multidisciplinary teams” and “communicate effectively”. An important component of these skills is the ability to reflect on one’s personal actions and the dynamics occurring within the group. This workshop is intended to provide participants with a practical exercise that can help students become more self-reflective and aware of group dynamics, while demonstrating the use of the “virtual facilitator” system to improve group dialogue.

The workshop will engage the participants in a self-directed learning exercise modeled after T-Groups. This exercise will help participants:

- 1) Become aware of their own patterns of behavior
- 2) Learn about the impact of their behavior on others
- 3) Evaluate the impact of others’ behavior on one’s self
- 4) Become more effective in interpersonal interactions

During the exercise participants may use a computationally intelligent “virtual facilitator”. It can be used in student exercises or project teams to help students learn communication skills.

This workshop will be of interest to engineering educators who desire to incorporate learner-centered approaches to learning but have found that their students need to gain awareness of team dynamics. It will be of particular interest to those open to non-traditional methods.

*Index Terms* – Active Learning, Teams, T-group, Experiential Exercises.

## INTRODUCTION

While ABET criteria require that engineering students have the ability to “function on multidisciplinary teams” and “communicate effectively” [1], far too often graduates do not have the necessary skills to identify and effectively manage dysfunctional group dynamics. History attests to the potentially disastrous consequences of this, through, for example, the space shuttle disasters [2,3,4]. The Columbia Accident Investigation Board found that “the hole in the wing of the shuttle was produced not simply by debris, but by holes

in organizational decision-making. Furthermore, the factors that produced the holes in this organization’s decision-making are not unique to today’s NASA or limited to the shuttle program, but are generic vulnerabilities that have contributed to other failures and tragedies across other complex industrial settings” [5]. In a less catastrophic example, a lack of ability to manage teams effectively can result in project failure from (as one of our Master’s students employed at a major corporation bemoaned) the fact that the hardware and software developers he was supervising couldn’t talk to one another without name-calling.

T-groups (the “T” is for “Training”) are a relatively unknown (at least in the engineering disciplines) approach to learning about team dynamics and their relationship to individual behaviors. They can be used as a method to help students become aware of their own and other’s behaviors in a group, and how those behaviors act to create group dynamics.

At the University of Missouri – Rolla, some of the students enrolled in a course called “Management for Engineers” participated (on an entirely voluntary basis) in an abbreviated (2-hour) T-group session. Student comments indicated that they found the session quite valuable, since it gave them experience thinking about groups and the way they interact in them that was quite unlike anything they had seen before.

T-group experiences can provide participants with valuable insights into group dynamics and the effects of individual behaviors on others. One engineering student who participated in a T-group realized what he was doing that triggered irritation among his team members, while another student began consciously changing his behavior so that he could lead more effectively.

While not necessary to the T-group experience, during the workshop participants will have the opportunity to use a computationally intelligent “virtual facilitator” [6]. (All necessary computer systems will be provided by the workshop facilitator and the computers will be connected wirelessly through a router provided by the facilitator.) The “virtual facilitator” contains a subset of the expert knowledge of a skilled facilitator, and will suggest questions that might assist the conversation. It may be used in student exercises or in project teams to help students learn team communication skills. Additional information about the “virtual facilitator”

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and its use as a tool to help students learn team communication skills can be found in the full paper "Expert System for Team Facilitation using Observational Learning" in Session 1530.

This workshop is designed to give participants some introductory experience with a T-group so that they might have the opportunity to learn more and potentially provide their students with this learning experience as well. While it is not expected that the workshop will make participants able to manage a T-group immediately, it will serve to increase their awareness of the method and its advantages. Additional information and suggestions for further learning will be provided at the end of the workshop.

Note, when involving students in T-groups it is strongly suggested that they be conducted on a voluntary basis. Coercive tactics, including, for example, grading based on activities in the T-group or forced participation, can inhibit the effectiveness of a T-group. Appropriate settings for T-group involvement might be as an option for increased learning about team dynamics in lieu of other activities. Also, since T-groups are rather time-intensive, our experience has been that they are best held outside of regular class hours.

### BACKGROUND

T-groups originated in the mid-1940's as a method to help individuals gain self-understanding and an awareness of behavioral dynamics in small groups. T-groups place on emphasis on feedback and openness to help learners gain insights into themselves and groups. Though many forms of T-groups have been developed, there is a common focus on behavior and the "here and now". They are generally unstructured and participant-directed [7].

T-groups provide a means to break down traditional hierarchy and authority structures so that participants can experience their own behavioral patterns "apart from" an institutionally imposed pattern [8]. This can shed light on how their own behaviors can act to create and preserve group dynamics that they sometimes may find problematic. Participants in T-groups often find themselves reflecting deeply on their own behaviors and motivations (e.g., see [9]). This can lead to the development of skills valuable in today's team-oriented, entrepreneurial organizations.

### WORKSHOP OUTLINE

The workshop will engage the participants in a self-directed learning exercise modeled after T-groups. The following activities will occur during the exercise.

#### *I. Introduction and Overview of the Workshop: 30 minutes*

There will be a brief introduction to the history and norms of T-groups and the use of the Virtual Facilitator. Participants will be asked to respect others' freedom of choice, to provide clear, unfiltered feedback, and to focus on the "here and now". Any assistance necessary in using the Virtual Facilitator will

be given. Participants will then be reminded of the published goals of the workshop:

- 1) Become aware of their own patterns of behavior
- 2) Learn about the impact of their behavior on others
- 3) Evaluate the impact of others' behavior on one's self
- 4) Become more effective in interpersonal interactions

Participants will be told that they may pursue these goals or others if they wish.

#### *II. Participant-directed dialogue: 2 hours*

Participants will be free to engage in dialogue in order to accomplish the goals of the workshop and/or additional goals as they so choose. The presenter will facilitate this portion of the workshop. The facilitation will be process oriented, rather than content oriented (i.e, what is talked about is not as important as how it is talked about).

The power of T-groups arises from the way that they allow participants to engage in and evaluate their habitual, preferred patterns of behavior. While an individual may not be conscious of these patterns, the open communication fostered during the session will help others surface their reactions, and the underlying patterns. The facilitator's role is non-directive, thus it is impossible to say specifically what will happen. What will happen depends on and is determined by the participants. A case study of what happens at a T-group [9] describes typical reactions, but these may or may not occur during any particular T-group.

Participants in the T-group may be called upon to manage several paradoxes [10].

- **Goals vs. Goallessness:** While the stated "goals" of the workshop are described in the introduction and overview, participants are also told that they may pursue these or other goals if they wish. The "group goal" of whether and how to accomplish the stated workshop goals (should they choose to do so) is uncertain. There may be a period of perceived aimlessness, exacerbated by the facilitator's non-direction. The formulation of explicit goals acceptable to all participants may be awkward. For example, some participants may suggest a specific goal, such as writing down methods to accomplish desired learning, while others may prefer a less structured approach.
- **Group vs. Member Maintenance:** The tension between the responsibilities of the group to members and vice versa may be a topic of discussion. What will it mean to "be a contributing member"? And what individual needs will the group take responsibility for? In T-groups this paradox is often evidenced by some members' relative silence while other members dominate the conversation. Both of these extremes are often perceived as individuals taking from the group without giving back.
- **Comfort vs. Growth:** Becoming more effective requires awareness of ineffectiveness. This may be an unpleasant and awkward experience. How will the group and

individuals negotiate the path toward learning? Or will they choose to avoid it? Participants often find that they are not being straightforward because openness makes them uncomfortable.

- **Authority vs. Freedom:** What limits to individual action will be imposed by the group? From whence will come the “authority” of the group, and will participants create, resist, or seek to submit to that authority? How might answers to these questions be determined – through individual fiat or group consensus? Participants often discover that they engage in unilateral decision-making far more regularly than they supposed – and that doing so may not be entirely appreciated by others.

Learning from the T-group will occur as participants become aware of their choices in negotiating these paradoxes, and the effects of their choices on themselves and others. They may become aware of areas that they were blind to, or personal defenses that are self-defeating in terms of accomplishing desired outcomes. This learning can result in improved abilities to perceive group dynamics and manage effectively the tensions between authority and freedom, group accomplishment and member support, and how to work together to craft a group that is aware of and responsive to its own peculiarities.

### III. Debriefing: 30 minutes

During this period, participants will have the opportunity to review the workshop in two ways. First, they will be able to reflect on the personal outcomes of the workshop and what they learned from it. Second, they may share thoughts on implementation of a T-group or the use of the virtual facilitator among their students. Further opportunities for learning and practice will be made available.

### CONCLUSION

Participants in this workshop will receive an understanding of the kinds of dynamics and skills involved in managing a T-group. They will also gain a sense of the kinds of learning that can occur through a T-group experience. The workshop will provide an opportunity for participants to evaluate

whether they would be interested in making a T-group or similar student-centered exercises available to their students. Information about opportunities for further experiences and practice will be made available during the debriefing.

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### REFERENCES

- [1] ABET (2006) *Criteria for Accrediting Engineering Programs*. Engineering Accreditation Commission, Accreditation Board for Engineering and Technology, Inc, Baltimore, MD, <http://www.abet.org/forms.shtml>.
- [2] Maier, Mark, (2002) “Ten Years after ‘A Major Malfunction’ ... Reflections on the Challenger Syndrome,” *Journal of Management Inquiry*, Vol 11, No 3, , 282-292.
- [3] Moorhead, G., Ference, R. Neck, C., (1991) Group Decision Fiascoes Continue: Space Shuttle Challenger and a Revised Groupthink Framework, *Human Relations*, Vol. 44, No. 6, pp. 539 – 550.
- [4] Edmondson, Amy C., Roberto, Michael A., Bohmer, Richard M.J., Ferlins, Erika M., Feldman, Laura R. (2005) “The recovery window: Organizational learning following ambiguous threats” in *Organization at the limit: lessons from the Columbia disaster* edited by William H. Starbuck and Moshe Farjoun. Blackwell Publishing, Malden, MA.
- [5] Woods, David D. (2005) “Creating Foresight: Lessons for Enhancing Resilience from Columbia” in *Organization at the limit: lessons from the Columbia disaster* edited by William H. Starbuck and Moshe Farjoun. Blackwell Publishing, Malden, MA
- [6] Luechtefeld, R., Watkins, S., E., and Flori, R., “Automated Discourse Interventions and Student Teaming,” (Work In Process paper) *Frontiers In Education Conference*, 19-22 October 2005, Indianapolis, Indiana.
- [7] Bradford, L., Gibb, J., Benne, K.. *T-Group Theory and Laboratory Method*. John Wiley and Sons, 1964.
- [8] Potter, S., *A Social History of the T-Group*. Available on the WWW at <http://www.psicopolis.com/Kurt/tgroupstory.htm>, accessed March, 2007.
- [9] Bradford, L. P., “Trainer-Intervention: Case Episodes” *T-Group Theory and Laboratory Method*, John Wiley and Sons, 1964, pp. 136-167.
- [10] Benne, K. D., “From Polarization to Paradox” *T-Group Theory and Laboratory Method*, John Wiley and Sons, 1964, pp. 216-247.