

Teamwork and Working in Teams

INTRODUCTION

As industrial processes and systems have become more complex, teams—not individuals—have become the basic working unit in modern engineering organizations. Because team environments foster interaction and open communication, and create a desirable setting for generating new ideas, the ability to function effectively as a member of an interdisciplinary team has become essential. The broad range of disciplines required to move an innovative idea through product development and testing, and ultimately to the marketplace, requires that engineers, material scientists, financial analysts, artists and others collaborate to create safe products that meet the needs of consumers.

In the early 1980s, American industry became acutely aware of the need to better compete in the global marketplace. The shocking slippage of market share by American automobile makers focused national attention on the need to improve product quality and organizational performance. Beyond Ford and General Motors, global competition gave incentive to companies such as 3M, Motorola and Hewlett Packard to focus on improved performance through teamwork. General Motors capitalized on team design and productivity to create the Saturn Division in the mid-1980s. Motorola uses product development teams distributed throughout the world to reduce time-to-market of new products, moving the work around the globe to a different team every eight hours. Christopher Galvin, Chief Executive and Chairman of Motorola, Inc., states that there is no longer a place in Motorola for an engineer that cannot work in a team [1]. The broad acceptance of teams as an effective approach to improve performance has fundamentally changed the work environment for engineers; today's engineers must master teamwork and communication skills as never before.

Working groups and teams are *not* the same thing. Individuals working on separate parts of a project, with little collaboration between members of the group until the pieces are pulled together near or at the end, characterize working groups. Teams are a different entity; they are collaborative units of people joined together to accomplish a common goal. The output of the whole team should exceed that of the sum of the output of individual members.

"The strength of the wolf is in the pack."

- Rudyard Kipling

Teams have been variously defined; however, most definitions share common themes. Scholtes [2] defines a team simply as a group of people pooling their skills, talents and knowledge. Katzenbach and Smith [3] add the elements of commitment and mutual accountability, defining a team as a small group of people so committed to something larger than themselves that they will not be denied. For this course, a team is defined as a group of people collectively driving towards a common goal, capitalizing on and respecting the skills and knowledge of *all* individuals.

CHARACTERISTICS OF EFFECTIVE TEAMS

Effective teams are rewarding and share many common characteristics. Respect for other team members is essential for team effectiveness. Valuing the strengths of teammates, while minimizing their weaknesses, promotes team cohesion. Cooperating as a team requires trust, focusing on—and believing in—the end goal, arguing less and exploring more.

At a minimum, there are five keys to a productive team: positive interdependence, individual accountability, promotive interaction, appropriate use of social skills and group processing [4].

Positive interdependence is achieved when members of the team rely on each other to complete the project. They understand that their individual success is inherently linked with that of their other team members *and* with the success of the team as a whole. Group members focus on two objectives to achieve positive interdependence: maximizing their own productivity and working to maximize the productivity of all other group members.

Individual accountability means that each team member is held responsible for his or her contribution to the completion of the project. Team members do not "slack off" and allow other team members to assume their responsibilities.

Promotive (face-to-face) interaction implies that group members recognize the contribution of others in the team and give positive feedback for their accomplishments. They *encourage* and *facilitate* each other to achieve team goals, recognizing the tremendous motivational power of positive feedback.

Appropriate use of social skills is necessary because interpersonal and small group skills are critical to team success. Group communication skills contribute to building positive relationships between team members and promote higher achievement and productivity.

Through *group processing* techniques, team members *reflect* on how well their team is functioning and how well members are using their social skills to help *all* members of the team achieve collaborative success. The entire team is committed to team success and recognizes that effective teamwork does not just "happen"; it is the result of investment, commitment and continuous maintenance of the team.

TEAM DEVELOPMENT STAGES

Teams mature experientially and in stages; designating a group of individuals to function as a team is only the first step in team development. The development of a group of people into a team

takes time, commitment and energy. To become effective, teams must establish common goals, and their individual focus must be on those goals, ahead of personal needs. The goal of teamwork is that, with time, a highly successful team will emerge that exhibits synergy between the individual members of the team. Two models of the phases of team development follow.

1. The Tuckman Model

Tuckman [5] describes four stages through which groups traverse as they mature into well-functioning teams. Not every team gets to the “performing” stage, resulting in a myriad of outcomes. The Tuckman model defines the four identifiable stages of team development as: *forming*, *storming*, *norming* and *performing*.

Forming

In this stage, members of the group are polite to each other. During this period team members assess each other and how they fit into the group; they test the limits of tolerance of their group members. Little tangible work is accomplished as people get to know each other. Productive work that can be accomplished during this time is to agree on group goals and to establish ground rules for how the team will work together. The group “being on its best behavior” characterizes the forming stage.

Storming

In the storming stage, members begin to let down their guard and argue with each other. However, if the conflict is not channeled in a productive fashion, the team is at great risk of disillusionment. Cliques that thrive on unhealthy conflict may now form within the team. In this storming phase, the group should develop strategies for encouraging constructive controversy and respecting differences of opinion. It is critical that the inevitable conflict that arises as groups begin to struggle with their differences be channeled in such a way to foster creativity and allow for the evaluation of a wide range of views. While not fun to work through conflict at the time, a group is well served by openly dealing with their differences and discussing their strategy for productive conflict resolution. Tuckman believes that groups that never learn to work through the storming phase—perhaps because they are conflict adverse and choose instead to allow one leader to set the direction for the team’s actions—are, in the end, less creative. Additionally, the team members can be divisive because they never learned to deal with their differences.

Norming

In this stage, group members accept and appreciate the differences of individuals, learn to productively work through conflict and focus on the task at hand. The risk of “group think” may be encountered if individuals “go along” with ideas to maintain harmony rather than introduce differences of opinion.

Performing

In the performing stage, group members have come to trust each other; they all reap the rewards as the group transforms into a productive, fun—and rewarding—team. During this stage, team members agree on goals; creative brainstorming is fostered; ideas, rather than personal agendas, are debated; and the team takes collective pride in their team accomplishments. Creative confrontation and innovative problem solving [6] characterize this stage.

2. The Cog Model

The Cog Ladder of Group Development [7] delineates the stages through which a working group passes as it matures into a well-functioning team. Cog's model recognizes that team development is a *process*; it takes time and energy to develop a group of people into a productive team. Individuals should expect the team development process to take time to unfold. Teammates should prepare themselves for a few difficulties as the roles of individuals within the team and the personality of the team develop. The five stages of the Cog Team Development Ladder follow.

Polite Stage

This stage is characterized by politeness as people get to know each other and establish their individual identities within the group. Group members go out of their way to avoid conflict during this early phase.

Why are We Here? Stage

In this stage, members of the group ponder the purpose of the group and their own contribution to it. Members may also ask the question “Why am I here?”

Bid for Power Stage

In this stage, the traditional roles of individuals within the group emerge. The roles that have been historically comfortable for people such as leader, writer, technical expert(s), task master, morale director, mediator, creative thinker, time keeper, etc., begin to define how the team will develop. As the roles of individuals emerge, and because the team has evolved past the polite stage, power struggles between individuals may begin to surface. Also, as team members begin to have expectations of each other, they may begin to subtly *expect* teammates to perform their preferred or “natural” role.

Constructive Stage

In this stage, individuals move past performing the role that is most comfortable to them to performing the role that best complements the other members of the team. This stage is characterized by enhanced harmony as team members envision and implement strategies that promote the purpose of the team.

Esprit Stage

In this “all for one and one for all” stage, reached by few teams, members within the team experience a high interdependence; the team shares in the esteem of group goals and accomplishments. In this stage, team members clearly identify with the team; they are proud of being a team member and demonstrate genuine caring for the welfare and success of their teammates.

- ◆ What stage of development is your group or team in now?
- ◆ Do all of your teammates perceive your team to be in the same stage of development?
- ◆ What can you do to promote the movement of your team to the next higher stage of development?

Learning to be an effective team member takes time and practice; it is a *learned* skill that is mastered over time by team members committed to the end goal of achieving an effective and productive team. A key to building a well-functioning team is the process of *reflection*, whereby team members actively think about and discuss among themselves the progress of their team through the stages of team development. Open and candid communication among team members regarding the contribution of individuals to the overall success of the team may be uncomfortable in the beginning. Repeated brief discussions among the team will make the process of analyzing team performance more comfortable and natural. Through *practicing* teaming skills and *reflecting* upon ones own and others' performance as team members, student teams learn teaming skills [8].

TEAM ROLES

Differentiation of roles within a team leads to better team organization and productivity. As team size increases, the need to differentiate between the roles of individuals increases. With time, the roles that team members naturally prefer tend to emerge. However, early in the team development process, team productivity may be promoted through the assigning and rotating of team roles. The characteristic behavior of a team member, i.e., their role, in the context of the team, defines the way other team members expect them to contribute to and advance the objectives and goals of the team. All team members are responsible for behaving in such a way as to further the objectives of the team. All are responsible for completion of a quality product, inclusion of all team members in the process, capitalizing on the strengths of all individuals and promoting an environment where all team members acquire new skills and knowledge. Each team should define the roles that will best promote their team productivity. Example roles include a team leader, a recorder/scribe, a facilitator and a liaison. Each role type is described below.

Weekly rotation of team roles allows all members to learn new skills and to appreciate the challenges inherent in each role. Some roles will be more comfortable than others. Reflection by the

team members on their experiences in the various roles strengthens team understanding and communication.

Team Leader

A team leader exerts the greatest influence on the team and is responsible for the overall project scheduling and deliverables. Effective leaders must change as the needs of the team evolve. Additionally, leaders understand that their role involves both task roles (managing tasks) and responsibilities associated with nurturing the emotional or people component of the team (leading people).

It is beneficial for a team to designate a different “leader” for each meeting and rotate the leadership on a weekly basis. Team leader responsibilities include, but are not limited to:

- ◆ Preparing of the meeting agenda, to be published and distributed at least a day in advance.
- ◆ Sending a reminder of the meeting time and place to all team members.
- ◆ Ensuring that the meeting remains focused on the agenda.
- ◆ Encouraging participation by all team members.
- ◆ Establishing an environment that fosters creativity where team members are respected, take risks and feel safe expressing their ideas.
- ◆ Furthering the overall goals and objectives of the team.

Recorder / Scribe

A recorder/scribe captures the team’s discussions in writing and documents decisions made and action items assigned. S/he communicates team decisions consistently and in a timely fashion. A team should designate a “recorder” for each meeting, and his/her responsibilities include electronically publishing and distributing the conclusions reached and action items assigned within 24 hours of the meeting.

Facilitator

A facilitator is responsible for ensuring that all team members’ opinions are expressed and evaluated. Also, the facilitator keeps time during team meetings and assumes the lead responsibility for furthering team cohesion and camaraderie. As with the team leader and recorder/scribe roles, the team designates a “facilitator” for each meeting. In addition to the above duties, the facilitator is responsible for moving the meeting along according to the established schedule.

Liaison

A liaison communicates with organizations outside of the team. S/he takes a lead role in establishing contact, following up on commitments, obtaining information, etc.

TEAM CONTRACT

Establishing a team contract at the beginning of the project, and reviewing it at least monthly, promotes commitment to the goals of the team. Prior to committing to a contract, the team should discuss *and document* the following for each team member and the team as a whole:

1. In what role(s) is each person most comfortable?
2. What role is the greatest “stretch” for each?
3. The greatest trepidation each has about the development team is:
4. The 6-8 most important characteristics of working effectively as a team are:
5. List 6-8 reasons why teams frequently fail:

See the appendix at the end of this chapter for a general format to create a team contract.

TEAM MEETINGS

Effective communication and strong leadership are at the heart of well-functioning teams. While each member of a team must fulfill his/her individual responsibilities and obligations to the objectives of the team, open and constructive communication between all members of the team is essential. Weekly meetings within the design teams and meetings between the team and the instructor promote common understanding of team objectives and progress.

Weekly team meetings provide an opportunity for team members to share their progress, challenges and concerns about the project. They also provide an opportunity for redirecting project tasks and reassigning work if necessary. In addition to the issue of task reassignments, team meetings create a scheduled format for creative brainstorming and problem solving.

“Productivity through people.”
- Singapore Management Philosophy

Team effectiveness is dependent upon many things, including a shared vision of the team’s goals and objectives, and a sense of belonging. Team meetings serve to keep all members engaged, thus avoiding unintentional alienation of any person.

While team meetings are essential for team effectiveness, meetings that lack focus, that drag on and are unproductive can be a source of frustration.

Elements for Effective Team Meetings

Effective team meetings do not just “happen”; they require leadership and an agenda that has been agreed upon and published in advance. Suggestions for effective meetings include:

- ◆ Designate team roles (leader, recorder/scribe, facilitator and liaison), rotating roles at each meeting to give all team members an opportunity to practice their teaming skills.
- ◆ Solicit meeting agenda items in advance and prepare a specific agenda for each meeting. Include time estimates for each agenda item.
- ◆ Choose a meeting place with few distractions and a consistent meeting time that is convenient for all team members.

- ◆ Agree on meeting rules of conduct (see below).
- ◆ Rotate providing refreshments for team meetings; eating together promotes camaraderie.
- ◆ Develop a specific list of action items from each meeting with commitment from the team member who will be responsible for completion of each task. Tasks might include exploring all patents related to the product, calling potential vendors to locate a component, etc. Publish a task list with a completion date for each action item in the meeting minutes.
- ◆ Commit to commitment. Remember, “a meeting is a process that begins when you decide to have one, and it doesn’t end until all the action items are completed” [9].

Rules of Conduct for Team Meetings

In order for team meetings to further the objectives of the team, they must be productive. Attendance at team meetings should be mandatory. On the rare occasions when one must miss a regularly scheduled team meeting, that person should notify all team members *in advance*, apprising others of their progress and pending action items.

Agreeing *in advance* on acceptable rules of conduct for team meetings promotes meeting that maintain focus, promote respect and order during team meetings, and establish processes for resolving conflict. Suggestions include, but are not limited to:

- ◆ Mandatory attendance at scheduled team meetings.
- ◆ Stick to the agenda. When the items on the agenda are dealt with, other non-agenda items may be added if time allows and the team agrees to discuss additional topics.
- ◆ Remain focused on the task at hand.
- ◆ Begin and end the meeting on time.
- ◆ Come prepared.
- ◆ Use an analytic, facts-based approach to problem solving whenever possible [4].
- ◆ Manage meeting time wisely.
- ◆ Brainstorm when fresh ideas are in short supply or complex problems present challenges.
- ◆ Allow for the expression of every person’s ideas, and give all ideas a serious hearing.
- ◆ Listen carefully to each other, and be courteous.
- ◆ Accommodate disagreements and criticisms without hostility.
- ◆ Refrain from all personal attacks.
- ◆ Demonstrate flexibility.
- ◆ Make meetings enjoyable; employ humor and respect.
- ◆ Resolve conflict through compromise and consensus whenever possible.

Team Meeting Agenda

Establishing a meeting agenda creates an atmosphere for team meetings that are orderly, focused and productive. Agendas should include:

1. Date, time and place for the meeting.
2. Designated meeting leader, facilitator and recorder.
3. Designated person(s) to bring refreshments.
4. Brief overview and agreement on the meeting agenda, with a statement of the primary objective of the meeting.
5. Short (5 minutes maximum) individual updates on progress made since last meeting, including a synopsis of any major obstacles encountered.
6. Group assessment of overall team progress, with a review of the project schedule.
7. Brief discussion/reflection of how the team is functioning as a unit.
8. Assignment of action items to be accomplished by the next meeting, with a responsible person assigned and a completion date established.
9. Meeting adjournment.

Team Meeting Complaints

Not all team meetings are effective. Inevitably, there are complaints about the productivity of team meetings. For example, the purpose of the meeting may seem unclear or team members may come to the meeting unprepared. Another frustration occurs when the meeting focus veers off track. If the meeting has deteriorated, participants may end up not discussing the issues at hand; they may dominate the conversation, start arguments or fail to actively engage in the discussion. This type of disruption can be extremely frustrating and obviously lead to a number of complaints from other team members. Lastly, complaints also arise when there is no follow-up to decisions made during prior meetings. It is the responsibility of *all* team members to respectfully keep meetings on track and focused. Every team member is responsible for the outcome of the meeting.

Instructor Meetings

Periodic meetings between all members of the team and the instructor contribute to a common understanding of the successes and challenges experienced by the project team. A key objective of the instructor is to help the team succeed. This is best accomplished if open communication and a spirit of collaboration is established and maintained throughout the project between all members of the team and the instructor and teaching assistants. A sample agenda for instructor meetings may include:

1. Date, time and place for meeting.
2. Review of progress since and action items from last meeting.
3. Discussion of major challenges faced.
4. Tasks to be completed by the next meeting and assignment of specific action items with deadlines.
5. Brief reflection by all on team performance.

CONFLICT RESOLUTION

The diversity of knowledge, skills and experience brought by people from different disciplines to the team is a source of strength and also one of challenge as individuals struggle to communicate with people outside of their own discipline. The needs and strongly held personal beliefs of individuals within a team often result in nonproductive conflict. Regardless of how well most team members work together, one person can sometimes slow group progress based on strongly-held personal principles. Controversy can be a positive contributor to the creative process; however, keeping controversy funneled so that it does not break down into interpersonal conflict is a challenge for teams. The team must judge when it is appropriate to let the controversy naturally dissipate, or if it is interfering with team cohesion and productivity, when it must be dealt with in a proactive manner.

One thing is clear, however, controversy that results in lowered team performance or diminished satisfaction of team members should be dealt with as soon as possible. It takes energy to cooperate with others. Conflict that arises within the team due to personality conflicts consumes energy that would be much better spent on achieving team goals.

Adapted from Johnson and Johnson [4], the following steps guide a team through a negotiating process to resolve a problem that arises from conflict between team members.

Step 1: Describe Your Interests and What You Want

Tactfully describe your perception of the problem and what you want as a desired outcome. Define the conflict as small and specific, not general and global. Take ownership of your interests and make personal statements about your wants and goals as the first step in the negotiation process. Remember that because you want something does not mean that the other person is obliged to give it to you. You should be *negotiating for common interest*, not for what you *want*. Approaching the conflict as a *mutual problem* to be solved, not as a win-lose struggle, creates opportunity for a successful outcome. Suggestions that may aid the negotiation at this stage include:

- ◆ Set aside a specific time and place where the interested parties can sit down to meet.
- ◆ Do not monopolize the conversation; take turns speaking with two-minute time limits for each speaker.
- ◆ Avoid being aggressive or intentionally hurting the other person.
- ◆ *Do* be assertive about your interests, goals and needs.
- ◆ Take ownership for your interests by using personal statements such as “I,” “me” or “my.”
- ◆ Define your views in as short and specific a manner as possible.
- ◆ Acknowledge the legitimate goals of the other person as part of the challenge to be addressed.
- ◆ Focus on a long-term cooperative relationship with statements such as, “I think it’s in the best interests of the team for us to talk about our argument.”
- ◆ Listen to the *wants* and *needs* of the other person.
 - Strive to understand the other person’s interests and feelings.

- Be a good listener; face the other person and be quiet while they take their turn.
- Show that you understand by paraphrasing what s/he said. This may feel strange at first. Try this approach: “You said...; I say...” For example: “You said that I’m always late for team meetings; I admit that I’ve been unreliable the last two weeks.”
- ◆ Describe your perspective of the other person’s actions towards you.
 - Focus on their behavior, not on them as a person.
 - Describe *behaviors* you have observed (e.g., rolling of eyes, interrupting when you’re trying to speak, not attending scheduled work sessions, etc.) without applying value judgments as to her/his motives.
 - Avoid personalized attacks.
 - Define the conflict as a specific set of actions, not the person’s general state of being.
 - Describe your personal reaction and feelings about the others’ actions.

Step 2: Describe Your Feelings

Feelings must be openly expressed in order to be resolved. If feelings are not dealt with in an open manner, “stuffed” emotions may later resurface as the root of additional conflict. Acknowledging that every person’s feelings are valid is essential for furthering the negotiation. To effectively negotiate, you must take responsibility for your feelings and constructively express them. Do not assume that the other person knows what you are feeling—tell them!

Step 3: Exchange Underlying Reasons for Your Opinions and Positions Relative to the Problem at Hand

By this stage, you should each have an understanding of the others’ interests, wants and feelings, as well as a clear mutual understanding of the specific, confined conflict. It is now appropriate to better understand the *underlying reasons* each of you have for your position.

- ◆ Set the stage for this step by *expressing your cooperative intentions* through statements such as “If we work together on this, we get through it easier” or “Let’s try to find a solution that works for all of us on the team.”
 - Be genuine; look for a win-win strategy.
 - Avoid subtly suggesting that one of you is right and the other is wrong.
- ◆ Present your reasons and listen to the reasons of the other person. Give the underlying *reason(s)* for what you want and work to understand her/his reasons. Only through this empathetic understanding can you search for creative, win-win solutions.
- ◆ Focus on the broad *interest* you and your team are trying to serve, not the *position* you have taken on a specific issue.
 - Approach the other person from the perspective of his/her *underlying* wants and goals.
 - Work to create new positions that let all parties reach some of their goals.
 - *Clarify the differences* between each of your wants and needs before trying to find mutually satisfying solutions.

- ◆ Empower the other person by being flexible and providing a choice of options. Feeling powerless leads to anger and frustration that can readily be avoided through alternative solutions. Allow yourself the flexibility to change your opinion as the negotiation proceeds.
- ◆ Timing can be everything; ensure that both parties are *currently* motivated to find a solution.

Step 4: Understand the Other's Perspective

This is a challenging part of the negotiation process. Do not assume that all parties to the conflict see the problem(s) from the same perspective. Both parties must work to see all sides of the issue, viewing the conflict from the other person's perspective while simultaneously keeping one's own perspective in mind. Clarifying the intentions of your teammate may help you realize that his/her intentions are not the same as your fears. Be sure that you understand both perspectives, and openly discuss opposing perceptions. Frequently confirm your understanding by restating what you think you have heard others say.

Step 5: Invent Options for Mutual Gain

Use each other's perspective to promote the generation of new, creative solutions. Generating multiple solutions is not easy! Be creative; think of as many potential solutions as possible. An approach to make this easier is to search for mutual gain, keep all perspectives in mind, and avoid judging the options until later. Generate at least three workable alternative agreements before selecting the one solution that you will jointly employ. Write down all suggested alternative solutions to ensure that potentially workable ideas are not lost.

While brainstorming alternative solutions, one can ease tension through incorporating the goals and values of your teammate(s) in *your* proposals. Evaluate and discuss each other's propositions before making a decision, remembering *to clarify differences* and *seek similarities*.

Step 6: Reach a Wise Agreement

A wise agreement is one that meets the needs and wants of both parties, promotes the long-term relationship of the parties and is perceived as fair by all. To test whether the solution is wise and should be adopted, evaluate if it can be judged against objective criteria such as:

- ◆ Does everyone have an equal chance of benefiting?
- ◆ Does the agreement meet the legitimate needs of everyone in the team (or those directly impacted by the conflict)?
- ◆ Do all parties to the conflict have a stake in the outcome?
- ◆ Are the gains and losses of all parties roughly in balance?
- ◆ Are team values honored?

Lastly, ensure that the agreement is fully implemented by defining measurable objectives and setting specific milestones. This can be readily accomplished by working together to answer the question: "How will we know if we have succeeded in implementing our solution?" A key to success

is to define *in writing* intermediate objectives that will lead to the successful outcome. Examples might include:

- ◆ All team members attend each Tuesday design session, beginning August 31.
- ◆ Individual ideas for conceptual design of the rotating arm will be presented at the September 7 team meeting.
- ◆ Janet and Larry will meet briefly every Wednesday morning for the next four weeks to review progress regarding their working relationship.
- ◆ Project concerns will be openly discussed at every weekly team meeting.

Peter Senge [10] discusses the power of “team learning” to mitigate controversy associated with differences of opinion. Senge’s concept of team learning requires mastering the practices of both *dialogue* and *discussion*. Dialogue is akin to brainstorming; it involves the free and creative exploration of issues without the interjection of judgmental views. During discussion, one’s views are debated and defended as the team together searches for sound arguments to support pending team decisions. During the discussion, controversy will inevitably emerge.

Creating an environment where respectful and constructive controversy is healthy and stimulates the expression of different points of view is exactly the goal of a well-functioning team! The key to success in constructive controversy is understanding how to respectfully and productively *manage* the controversy to promote both creativity and productivity.

REFERENCES

1. Galvin, Christopher, Chief Executive and Chairman, Motorola, Inc., 1996. Presentation at the ASEE International Conference on Engineering Education. Washington, DC, June 1996.
2. Scholtes, Peter, 1988. *The Team Handbook: How to Use Teams to Improve Quality*. Madison, WI, Joiner Associates, pp. 2-7.
3. Katzenbach, J., and Smith, D., 1993. *The Wisdom of Teams: Creating the High-Performance Organization*. Cambridge, MA. Harvard Business School Press, p.45.
4. Johnson, David D. and Frank P. Johnson, 1997. *Joining Together: Group Theory and Group Skills*. Boston, MA. Allyn and Bacon.
5. Tuckman, B., 1965. Developmental Sequence in Small Groups, *Psychological Bulletin*, 63, pp. 384-389.
6. Hanwit, Jesse. Four Stages of Teambuilding. <http://www.ttacev.org/articles/team.html>.
7. Cog’s Ladder of Group Development. <http://www.teleport.com/~oro/ndindex/Cogs.html>.
8. Lewis, Philip, Aldridge, Dayne and Swamidall, Paul M., 1998. Assessing Teaming Skills Acquisition on Undergraduate Project Teams, *Journal of Engineering Education*, 87, pp. 149-155.
9. Lippincott, Sharon M., 1994. *Meetings Do’s, Don’ts and Donuts: The Complete Handbook for Successful Meetings*. Lighthouse Point Press, Pittsburgh, PA, ISBN 0963796631.
10. Senge, Peter M., 1994. *The Fifth Discipline: The Art and Practice of the Learning Organization*. Currency/Doubleday.

APPENDIX: TEAM CONTRACT

We, the undersigned members of Team _____, have fully discussed and reached consensus on the following items:

- 1. Methods of Communication: List all the methods of communication that will be used by our team, including individual's commitments to those methods.

- 2. Team Meetings: List the time, location and goals of regularly scheduled team meetings.

Does each team member **commit** to contribute to all team meetings? (circle and initial)

_____	yes	no	_____	yes	no
_____	yes	no	_____	yes	no
_____	yes	no	_____	yes	no

What action is required *in advance* if a team member must miss a meeting?

How will the non-attending team member's contribution be captured in advance of the meeting?

- 3. Conflict Resolution: The conflict resolution process(es) our team will employ include (describe ways to reach consensus on items of disagreement):

I fully commit to the items above and understand that contributing to the effectiveness of my team is required in this class.

Signed: _____	Date: _____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

