Employing a Team Performance Review to Negotiate Grades

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Abstract

Assessing and grading student performance in design courses often conflict with one another and often generate uncertainty about their effectiveness in promoting and measuring learning. This paper describes how to effectively administer and facilitate a half-hour, open-forum, team-review session that validates assumptions about team member contributions and aligns grading with mutually understood performance criteria. The negotiation phase of the team interview rarely changes the instructor's assignment of individual grades from previous sources of information. However, the process has been found to significantly increase students' understanding and acceptance of the grades they receive.

Students and faculty gain insight about circumstances leading to less than expected team member performance and how the lessons learned can be used to promote better learning opportunities for future teams. Included are (i) team roles and responsibilities, (ii) team attitude and climate, (iii) time management, (iv) team member contributions and rewards, (v) internal and external communication, and (vi) setting and achieving goals. The process also provides an opportunity to address and resolve lingering issues that affect team performance that are likely to go unprocessed by the team at the end of their design experience.

Multiple instructors have effectively used the process to assign valid grades to team members in introductory engineering design and physical science classes. All of these courses feature cooperative learning activities and open-ended projects throughout the term.

Introduction

There are numerous methods that have been used to determine team scores. The method described in this paper engages the entire team with the instructor or graduate student collaboratively to determine a team midterm or final grade. It takes about thirty minutes per team to complete.

The team interview session is a formal process that is designed to measure soft skills such as participation, communication and team process. Individual elements include sharing the workload; participation in discussion; attendance; effective use of time; attitude and climate of the team; team communication issues; performing team roles; dealing with difficult issues and setting and achieving goals. An extended version additionally includes assessing knowledge of the process and how well products were developed. Grades for these last two items are evaluated

using other methods, so they are not typically included in the interview process. They are included in this paper as a reference for completeness.

The method has been tested and improved by multiple instructors in Introduction to Engineering Design[1] classes and Physical Science classes. Both classes are structured around developing quality teams to understand concepts or developing innovative products.

Included in this paper is detailed team performance criteria that help teams identify their team characteristics (see Appendix A: TIDEE Team Assessment Criteria), a handout that is given to the students prior to the meeting (see Appendix B: TIDEE Team Meeting Handout), and detailed implementation instructions complete with agenda for running the meeting. The package is developed as a turnkey process that can be effectively used by a novice.

The flexibility of the process permits experienced facilitators to effectively deal with differences in teams, their structure and style of communication, while at the same time being able to resolve unanswered issues, set team or future goals, and determine a grade for each team member. The instructor makes the final call on grades, but welcomes input from all the team members, not just the most vocal ones.

Most instructors report that they can never adopt an attitude of having seen-it-all because almost every set of team interviews for a class produces a new twist or a surprise. Even the most astute instructor's observation of the team behavior during the term will miss much of what goes on within the team. This is true because most of the team deliberations are not done in the presence of the instructor. The most difficult issues are kept hidden because team members believe that they have the power to resolve them without outside intervention.

Problems are not always identified early in the teaming cycle[2], which goes through forming, storming, norming and performing stages. Most teams reach the storming stage within three weeks. If the project is longer than this period of time then the instructor should infuse strategies for team development throughout the curricular materials. This will provide the framework for most teams to work out team differences and begin to build a structure that will move their team into becoming a super-performing team where the sum of the efforts is much better than what the sum of the team people could do working independently.

Teams that are performing at a high level are a joy to assess. It is the team that has only partially worked through the norming state that needs the most help and of course, this type of team creates most of the surprises that emerge during the interview process.

At the onset of the meeting, a major premise is to assume that every member of the team will receive the same grade. However, the process does permit each of the students to receive a different team grade. When the possibility exists that different grades will be assigned to team members, then the process must be done in an open, non-threatening manner. Each person must be able to defend their actions to refute or support why they might receive an inflated or lower grade than the other team members. Often the discussion unearths reasons for specific behaviors that become acceptable to an accuser. For example, a team member may miss the contributions

that another makes because they're unaware of the importance of the actions taken by a person with a different learning style.

Results of this team assessment process compare favorably with previous work using other Transferable Integrated Design Engineering Education (TIDEE) assessment tools[3], which include a Design Team Readiness Assessment[4] that measures team design skills of four person student teams as they engage in a short design project, a verbal protocol analysis[5], ranking of course activities, continuous classroom improvement assessment activities, and surveys that assess students' perception of their growth[6].

Instructors who have used the process described in this paper typically are enthusiastic supporters of it. They find it beneficial for students on all kinds of teams. For teams that worked well together from the beginning, the interviews highlight and confirm the factors that led to success. For teams that struggled, the presence of the instructor helps students to confront problems they did not face on their own and to develop strategies to avoid such problems in the future.

Comments from students after the team exit interviews have been mostly positive. Examples include, "The team meeting was the most valuable part of this (class)", and, "Good process, it helped show our strengths and weaknesses". Of course, students always give feedback on missed objectives: "The meeting should give everyone a couple of minutes to speak their own point of view. Some people didn't talk as much as others, so their point of view was not expressed." This one typifies the most frequent comment from teams that will continue for the rest of the quarter: "The meeting went well. We were able to talk about our issues and decided, as a team, on solutions."

Deployment of this interview process provides a reliable feedback mechanism that can increase student learning if their team continues to work as a unit or to provide strategies that can be used to develop future teams.

Interview Process

Background
This assessment is designed to assess teams after they have worked together for a significant period of time. The process is based upon the instructor providing a supportive and open forum to ascertain how a team functioned and performed when they engaged in an engineering design process.

The assessment focuses on understanding contributions of team members, communication between members and the process that the team used to develop their products. It provides opportunities to understand how the team's roles and responsibilities affected the team process; provide insight into the attitude and climate of the team; identify how the team communicates and effectively used time; and determine what contributions each team member had on the process.

This assessment process will provide an opportunity to address and resolve issues that have contributed to negative performance, and set goals that could lead to improved team performance

with this or subsequent teams. This assessment may also be used to determine a team score or grade for each person on the team. It takes about a half-hour to assess each team.

Administration of the assessment is most effective if it is done twice, once near mid-term and the other at the end-of-term. There are at least three effective strategies that can be employed.
1. Give the assessment when the team has completed all of its work within a unit or project. Administering the assessment at this time will provide immediate feedback to team members, provide closure to the process and can be used to determine grades.
2. If one of the objectives of the class is to learn how to develop highly functional teams, then the assessment of the first team might be delayed until a second team is formed and has begun to develop its own synergy. This timing will provide students with an ability to compare differences in team structure and be able to better understand what constitutes a functioning first team. In addition, the students will be better able to apply this information to make their second team more effective. About two weeks after the second team is formed is an appropriate time to do the assessment to maximize both reflective and application processes.
3. Administer the first assessment somewhere between a half and two-thirds of the way through a project. This will provide an opportunity for each team to set goals and develop strategies to improve their team performance. It will also provide an opportunity to deal with adversity in a positive and supportive environment. Issues might include the social loafer, negative communication skills, non-sharing of responsibilities, etc.

Pre-Interview Instructions
Measurable objectives for the course should be given to the students at the onset of the class, which could include the "TIDEE Team Assessment Criteria," (See Appendix A.) The instructor could periodically use these criteria to engage the teams in a reflective team assessment to determine team performance in participation, communication, process, knowledge and products.

The "TIDEE Team Meeting Handout" (See Appendix B) should be passed out to each team member prior to their team-performance review session. A short discussion at this time will help set the framework for a productive team meeting. Emphasis should be placed on the following:
1. The handout sheets are intended to describe what issues will be discussed. The assessment is intended to be a dialog between team members and the instructor, rather than preparing a canned response.
2. Schedule the meeting outside of the class meeting time. However, finding a time when all team members are available can be difficult. Holding the meeting during a class period is another alternative. This would insure that all members would be present, but teaching/learning strategies must be deployed so that teams not engaging in the discussion would continue to progress towards achieving course objectives.
3. Ensure that ALL team members can make the meeting and emphasize that they must arrive at the beginning of the meeting in order have time to deal with all issues. The process usually takes a half hour to reach appropriate results.
4. If for some reason a team member doesn't make the appointment, then the other team members will determine his/her score.
5. The meeting will focus on determining the performance of the team in an open face-to-face meeting and setting goals to improve this team or subsequent teams.

6. Initially the process will begin by assigning the same grade for all team members. However, during the process the team may reach a consensus where the grades of some team members are elevated or others demoted.
7. The process should be conducted in a supportive manner and address lingering or unresolved team issues.

Suggested Agenda for the Interview Session
It is often difficult to meet in a neutral setting. Set up the meeting room (which might be your office) so that all team members will feel welcome and comfortable. The following suggested agenda works well to address the issues and eventually give a grade to each of the students. The most reliable results are achieved if the instructor and/or graduate student facilitating this assessment has worked with the teams during class sessions and has observed their behavior. The suggested agenda includes tips and techniques as a resource for you to use. Adapt the methods to fit your own style of facilitation. Graduate students will need some training in order to effectively run this session.

5 Minutes: Review Agenda and Emphasize Session Goals
A. Greet the team members and make them feel at ease.
B. During the session students are encouraged to use positive and supportive language. Describe that the meeting is not to point fingers of blame, but the focus is to determine what each of the students can do to help resolve issues and problems. A personal experience may be used to help to set the context of the procedure. For example, a project was severely set back because a shipment of materials that was needed to complete a project didn't arrive. A junior engineer eventually discovered that the package had been in receiving all the time. It had not been properly labeled so it was not delivered. Ask the students what should be done to avoid that problem in the future. Use the discussion to illustrate that problems happen on all teams, and that problems and issues should be identified, discussed and resolved.
C. All discussion is to be open and each person will have an opportunity to contribute to the process.
D. A grade will be determined at the end of the session for each student. This is a team grade and the expectation is that all will receive the same score. However, with team consensus, an individual may be elevated or demoted depending upon performance. Even though it is a team process, the instructor will determine the final grades.

10-15 Minutes: Open Discussion about Team Performance
A. Ask team members to describe how they performed within each of the following categories that are listed on the interview criteria sheet. Use the "TIDEE Team Assessment Criteria," the "TIDEE Team Meeting Handout" and their team journals as resources.
   Participation
   - Sharing the workload.
   - Actively engaging in discussion.
   - Attendance.
   - Effective use of time.
   - Attitude and climate of the team.

Communication
- How effectively team communicates to support team effort.

Process
- How well team members perform different team roles in contributing to team effectiveness -
- How the team dealt with difficult issues.
- How well the team set and achieved goals for improvement.

B. Get everyone involved with the process. Ask lots of open ended questions. Serious problems usually emerge during the discussion. A method that could start the process rolling is to ask the following sequence of questions:
    a. Who did the most work?
    b. Who did the least?
    c. If this begins finger pointing, diffuse with questions like what could each of you have done to rectify the problem?

C. Draw out individuals, especially those who are more reserved, by asking for their input. Ask different team members to speak first. Often times a leader will want to respond to all of the questions and the followers will then concur. Don't let this continue because you will miss some valuable comments.

D. Have the students build on each other's comments.

E. Ask for concurrence or alternative positions. The team may have different responses to a question depending upon how long the team has been in existence. For example, there may be multiple correct answers to the question *"How well team members perform different team roles in contributing to team effectiveness?"* This may be an appropriate time to point out that team structure changes as the team develops.

F. Summarize ideas by rephrasing the concept and ask if this is the intended message.

G. Resist injecting instructor's class observations. They can be added at the end during the summary of the team's performance.

H. Deal with unresolved issues!
    This is a critical time and the instructor must be careful to use it as a learning experience rather than a finger pointing exercise. Let everyone have an opportunity to provide their opinion on the issue. Often, team members will not see contributions that others have made to the team. They often judge based upon their own learning styles. Other times a person will admit to not doing their part. This discussion could lead to finding strategies to make future teams more effective and productive.

I. Summarize the team's performance based upon what they have discussed. Add classroom observations and try to establish an overall picture.

5 Minutes: Set Team Goals for Improved Performance
A. Ask the team to determine 3 to 6 goals that they could use to improve the team performance. Help them formulate non-trivial goals. Make sure that they know that they will be held accountable for reaching these goals.

B. If this team will disperse, then help them find 3 to 6 strategies that they could use to help them develop a future team.

5 Minutes: Determine Grades

A. Reaffirm that all team members should receive the same score. Remind them that you, the instructor will determine the score, but their opinion is valued

B. Pass out a blank card and ask each person to independently fill out what they think the team score should be and justify why they have chosen that score. If you feel brave, record your own score on your sheet of paper, but select a range that you feel you could accept.

C. Collect the cards and shuffle them. Read responses one-by-one.

D. Make your decision and tell the team members why you have selected your score(s).

E. Thank everyone for coming and participating in the process.

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Biographical Information

KENNETH GENTILI
Kenneth Gentili has been an instructor at Tacoma Community College for 35 years as an instructor in engineering and physics. He is currently on leave at the National Science Foundation serving as a Program Director in the Division of Undergraduate Education. He has developed curriculum and assessment tools in engineering design, introductory physical science, and critical thinking. He has won numerous teaching and service awards.

JIM LYONS
Jim Lyons worked for the Boeing Company for seven years and the Westinghouse Electric Corporation for thirty-one years as an engineer and engineering manager before retiring in 1999. In 2001 he began a second career as an engineering instructor at Green River Community College and Tacoma Community College. He is an active participant in developing and testing curriculum and assessment tools in engineering design.

MARY COOK
Mary Cook is the Course Manager for the Introduction to Engineering Design at the University of Washington, a truly interdisciplinary course that uses examples from a variety of engineering disciplines. She has served as an

academic advisor for the College of Engineering at the University of Washington and was an Instructor in engineering at Tacoma Community College, where she began the development of this survey. She has received an outstanding staff Award from the College of Engineering in 2002.

Appendix A: TIDEE Team Assessment Criteria

Use the following performance criteria to determine your team's character. Be prepared to give specific examples to support your team assessment. You will work with your instructor to determine a team performance grade. All members may receive the same grade, unless the team decides that an individual member's grades be elevated or lowered for superior or poor team performance.

Participation
Sharing Work Load -
1. All team members contribute equally to the process, and add value to the team process or product.
2. Workload is shared, but one or two members contribute as minimally as possible.
3. One or two team members do most of the work. Input from other team members would improve product or performance.
4. One or more team members are "social loafers" and do not contribute appreciably to the work load.
5. Workload is unequally shared, and is completed by the person "knowledgeable" in the subject with little input from team members.

Actively engaging in discussion -
1. Team members listen attentively, while asking questions at appropriate times.
2. Team has a strong activist who prods quiet members to contribute to the discussion.
3. Team members usually ask questions and participate, but occasionally lose focus and drift away.
4. Team members have a lackadaisical attitude and minimally participate in the discussion.
5. Team members physically attend, but are easily distracted and contribute little to the discussion.
6. Team members are excessively disruptive. Team has difficulty keeping process on track.

Attendance -
1. Members attend all meetings or in case of emergency, make concerted effort to contact everyone else and make an effort to make up what was missed and continue to contribute to the team effort.
2. Members miss meetings, but make up was missed and continue to contribute to the team effort.
3. Members miss meetings occasionally and they never follow up on what happened in class or at meetings.
4. Members often miss meetings and never find out what happened on missed days. Team functions as though they were non-contributors.
5. Members often come late or leave early, thus causing the deliberations to bog down and not be very productive.

Communication
How effectively team communicates to support team effort -
1. Team usually uses positive and supportive language to enhance the team effort.
2. Team members often use non-supportive language, sarcasm or killer phrases, which disrupts the process.
3. Team members usually check to see if all team members understand concepts before continuing the process.
4. Team members do not check often enough to understand where other team members are in their development, which may create a situation where some team members may become isolated and/or not very productive.
5. Team uses adversarial communication skills and/or does not support each other, which may create a dysfunctional team.

Attitude and climate of the team -
1. Team uses rewards and positive reinforcement to encourage all team members to do their best job possible and to keep conflicts to a minimum.
2. Members are encouraging and conflicts are quickly resolved.
3. Members are open to ideas and conflicts resolved over time.
4. Members show minimal interest in other team member's ideas, and conflicts are often ignored.
5. Members are negative or disrespectful to one another, which might create a dysfunctional team.

Process
Effective use of time -
1. Team meets timelines with minimal rushing by creating and following a specified plan.
2. Team's use of time could be more effective, but still meets the deadlines.
3. Team has difficulty keeping process on track.
4. Team has minimal plans, scrambles to meet deadlines and consequently product is not fully developed.
5. Team gets sidetracked often and does not fully complete assignment.
6. Team forgets all obligations until it is too late to complete assignment.

How well team members perform different team roles in contributing to team effectiveness -
1. Team members change roles often to gain experience and consciously try to complete associated responsibilities.
2. Team members try each role, and then fall into more permanent roles, which utilize the natural strengths of each member.
3. Team members choose different roles only when it is required. Team members primarily accept their "power" or "comfort" role, and team effectiveness might diminish if key members were missing.
4. One or more team members ineffectively participate or contribute in any role; other team members take up the slack. Team does not develop and implement a plan that creates more equity in team participation.
5. Sometimes too many people fill the same responsibilities whereas other areas are ignored and

not done.
6. The team functions chaotically where one or more team members take on all of the roles or no one assumes any.

How the team dealt with difficult issues -
1. Team members organize an objective discussion period where problems are presented objectively and team members reach consensus through compromise and supporting one another.
2. Some team members work towards a consensus while others do not participate, thus creating a solution, which may need to be refined at a later date.
3. Team employs ineffective strategies to solve a difficult issue. Some issues may not be resolved.
4. No specific intervention plan is created to deal with vital problem. Team members deal ineffectively with the problem and hope it will dissolve in time.
5. Difficult issues are never discussed which creates a divisive split in the group; dislike and discomfort occurs between members, and some members feel excluded and not important.

How well the team set and achieved goals for improvement -
1. Team reflects often on how well they complete intermediate tasks. There is an overall general desire for improvement after each step and specific goals are outlined and repeatedly referred to, to gage progress. Team members give rewards to each other for exemplary team performance.
2. Team writes goals and reviews them occasionally, which impacts the team's effectiveness.
3. Overall desire to complete each step in process better than the last. No specific goals outlined, but team members spontaneously give recommendations and reflect on process to improve team performance.
4. When required, team members write goals, but team seldom refers to them or makes a conscious effort to improve the process.
5. Team never reflects on the quality of their performance. Goals for improvement are not established and all members make little effort to improve the process.

Knowledge
How well the team members understand the engineering design process -
1. Team members can identify the major components of the design process, describe why some steps were more effective than others during a design process, understand how communication and teamwork contribute to a successful project, and can identify the iterative nature of the design process.
2. Team members understand the major components of the design process, can identify the steps when they are applied during a design process, and are generally aware that communication and teamwork can affect performance.
3. Team members have a good grasp of the design process, but ideas are not fully developed and how they relate to each other.
4. Team members presume there are steps in the design process, but conceptually do not understand how to identify all steps and when the steps should be applied.
5. Team members have little knowledge of the design process and how it is organized.

Product

Team Journal -
1. The entries by multiple recorders are significantly different in quality, which ranges from professional to minimally recorded information.
2. Neat, highly organized, easy to extract pertinent information, and a detailed and accurate record of <u>all</u> meetings, including diagrams, team ideas, activities, analysis and reflections.
3. Records kept of all activities, mechanics, critical analysis and process development, a few parts could have better organization, pertinent information sometimes difficult to find or extract.
4. Could improve on organization and recording of details, information not sufficiently recorded in one or more areas, such as activities, analysis, idea generation, sketching, process development and improvement, etc.
5. Difficult to extract information, may lack table of contents, poorly organized, vital information is missing.
6. Shows minimal effort and meets few of the requirements of effective journal keeping. Many entries are disorganized, sloppy or incorrect.

Posters and Presentations -
1. Full participation, professionally done, comprehensive with an in-depth technical component, all members have a good understanding of concepts, smooth presentation, and excellent job of incorporating poster into presentation.
2. Poster or presentation has good ideas but needs to improve in one or more areas including organization, flow, objective, clarity or summary.
3. Much time is spent on either developing a poster or presentation, resulting in a significant difference in quality.
4. Poster or presentation is creative, but lacks a depth of technical knowledge.
5. Partially completed, not well prepared or presented, nor a group effort.

Projects -
1. Project completed on time, meets all customer requirements with comprehensive ideas and conclusions, is very creative, and reflects all team member's contributions.
2. Project completed on time with all team members contributing, meets all customer requirements and is creative.
3. Project completed, however, quality of ideas, technical data or conclusions could be significantly improved.
4. Project meets most criteria, but has a few significant errors that would affect the outcome of the project.
5. Low team effort, incomplete, partially developed, and poor quality.

Other performance criteria for poster presentations and/ or projects -
a. One or more of the team members do not fully comprehend the material. Other members cover for them so that the team *appears* to be very knowledgeable about the subject.
b. One or two team members do most of the work. Input from other team members would improve product or performance.
c. When a team member is absent, the team is prepared to execute a backup plan and cover for that person and materials that are missing.

Appendix B: TIDEE Team Meeting Handout

Each class member will attend two team evaluation sessions between now and the end of finals. All team members must be present with the instructor to determine a team score. If a team member is missing, then those present will determine the score.

The team should evaluate itself on participation, communication, and process. Team journals should be brought to the evaluation session to use as a resource during the evaluation process.

The team should come prepared to suggest a score and why they should receive that score. *Usually all team members will receive the same score. However, a **team may decide to assign different grades to individual members for unusual circumstances.*** Areas of evaluation could include the following:

Participation
- Sharing the workload.
- Actively engaging in discussion.
- Attendance.
- Effective use of time.
- Attitude and climate of the team.

Communication
- How effectively team communicates to support team effort.

Process
- How well team members perform different team roles in contributing to team effectiveness -
- How the team dealt with difficult issues.
- How well the team set and achieved goals for improvement.

Name of Student _____
Team Name _____
Evaluation Date & Time _____
Evaluation Place: _____
Team Grade_____