Team Member Evaluations: Diving into Engineering Teams

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Context: In-class; Statics
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Student Activity Time: 10 minutes

After a sophomore engineering design project, students reflect on their team experience using an evaluation form.

Introducing the Reflection Activity

The group engineering design project is a substantial portion of students' time and energy in the sophomore level statics class. During a 5 week design and build project, students are offered the chance to evaluate their team members for their contribution to the entire project. The design project is part of courses such as statics or mechanics of materials and includes a design-build-test project. Student teams of 3 or 4 are to build a structure with popsicle sticks, plaster, carbon fiber, or other materials to meet specific design requirements. Like many engineering classes, team processes or team building are not covered in the course content, so students are to make sense of and navigate the experience independently. The purpose of this activity is to assist students in making sense of their team design experience, and its impact on their final project.

During the project-testing day, students see other teams' designs and test the structures to determine which ones best meet the required specs. At the end, students submit a team evaluation form previously distributed at the beginning of the project introduction. The evaluation form asks students to rate their team members' contribution to the project, but also consider their role on the design team.

Possible outcomes of this activity are students' identification of their own approach to engineering team work, evaluation of other teams' processes and performance. Ideally, students use this information to improve their team practices in the future. After completing the evaluation, students often consider how to select engineering design teams in the future, and evaluate their team processes to ensure success.

Recreating the Reflection Activity

	Description
1	Identify and assign a group design project.
2	Introduce the team evaluation when assigning the project.
3	Provide students with a timeline to complete the design project (approx. 5 weeks).
4	Conduct design project testing in class.
5	Administer team evaluation form at the end of project testing.
6	Identify and assign a group design project.

In the words of the Educator: Tips and Tricks

Low risk grade, high reward experience. The team member evaluation is a small part of the project grade; it needs to be a lower risk, because I don't teach team building in the class. I don't even comment on it. Let's put you on a team first, so I am pushing them into the deep end of the pool when it comes to team processes. The project itself is not a simple problem so they have to wrestle with the technical aspect and the team at the same time. We are going to throw you in an activity, and let you find a way to make it work. It is important that the project and the team member evaluation is only a small part of the grade. The stakes have to be low since the main focus is the project itself. The team gets the same grade for the product, but any individual team member might get additional points if they are standouts. At the same time, some team members may lose points if they are evaluated very negatively across the board.

Share the evaluation in advance. If you plan to use an evaluation form, make sure the students know about it up front. If I were to throw in additional questions, behaviors and actions may have improved. When they read the evaluation form, it indirectly has a monitoring effect. I wanted it to be a good experience, so with the evaluation upfront, I think the teams perform better.

What was the inspiration for the reflection activity? In the past, I did not have the team member evaluation, because the focus was just on building a functional product, but I started using it to address the issue of participation. Some students say that the building project is just a small component of a group grade and decide not to do the work -- and some people still behave in the same way. On the team evaluation of basic ratings and comments, they are asked to evaluate each team member for their contribution. When I added the team member evaluation, it was just for feedback. Later, I began to add or take away a few points for individuals or the team, so it has been an evolving piece. The evaluation is helpful in identifying dysfunctional teams. Some groups do not put a lot of thought into the evaluation, but some do. I really like it when they do because we can see evidence of it with better results in the project testing. It gives something for other students to aspire to.

In the future I really want to tie in the concept that reflection is for the future, so beyond just how they evaluate the team, I would like to have each team member identify actions or behaviors that they plan to implement in their next team experience. And maybe a preparatory question would be to consider what actions or behaviors would have been improved your team. If your team was dysfunctional, what could have been improved? That is totally a companion effect, but I do want students to say, "hey I want to aspire to make things better, if I have a team member that is really strong; I want to aspire to

be stronger." It somewhat expands to the project, it's no longer just about building a structure and testing it; it's about being a good team member too.

My approach is you've got to try it and learn. I think that is where the reflection is important. I want them to have a post experience debriefing and consider what would qualify as good team behavior. Adding a couple of directing questions about an action plan for the next time they are in a team would be helpful. I am pleasantly surprised at things they bring up that I would not have thought of.