Supplemental Material

Premo *et al.*

<p style="text-align:center;">Overview of Survey Data Collected</p>

All survey data was collected via the online CATME platform that can be found at www.catme.org . It should be noted that while all of the items were in the CATME platform they came from a variety of peer reviewed articles. Thus we have provided individual citations for sources for different sections of the overall survey where appropriate.

Evaluations of Peer Teamwork Behavior/ CIKEH (completed for each group member, Ohland et al., 2012; descriptions of ratings can also be seen at www.catme.org) (Cronbach's alpha = .89)

C = contributing to the team's work (single rating)

Rating	Description of Rating
5	- Does more or higher-quality work than expected. - Makes important contributions that improve the team's work. - Helps teammates who are having difficulty completing their work
4	- Demonstrates behaviors described immediately above and below.
3	- Completes a fair share of the team's work with acceptable quality. - Keeps commitments and completes assignments on time. - Helps teammates who are having difficulty when it is easy or important.
2	- Demonstrates behaviors described immediately above and below.
1	- Does not do a fair share of the team's work. Delivers sloppy or incomplete work. - Misses deadlines. Is late, unprepared, or absent for team meetings. - Does not assist teammates. Quits if the work becomes difficult.

I = interacting with teammates (single rating)

Rating	Description of Rating
5	- Asks for and shows an interest in teammates' ideas and contributions. - Makes sure teammates stay informed and understand each other. - Provides encouragement or enthusiasm to the team. - Asks teammates for feedback and uses their suggestions to improve.
4	- Demonstrates behaviors described immediately above and below.
3	- Listens to teammates and respects their contributions. - Communicates clearly. Shares information with teammates. - Participates fully in team activities. - Respects and responds to feedback from teammates
2	- Demonstrates behaviors described immediately above and below.
1	- Interrupts, ignores, bosses, or makes fun of teammates. - Takes actions that affect teammates without their input. Does not share information. - Complains, makes excuses, or does not interact with teammates. - Is defensive. Will not accept help or advice from teammates.

K = keeping the team on track (single rating)

Rating	Description of Rating
5	- Watches conditions affecting the team and monitors the team's progress. - Makes sure that teammates are making appropriate progress. - Gives teammates specific, timely, and constructive feedback
4	- Demonstrates behaviors described immediately above and below.
3	- Notices changes that influence the team's success. - Knows what everyone on the team should be doing and notices problems. - Alerts teammates or suggests solutions when the team's success is threatened.
2	- Demonstrates behaviors described immediately above and below.
1	- Is unaware of whether the team is meeting its goals. - Does not pay attention to teammates' progress. - Avoids discussing team problems, even when they are obvious.

E = expecting quality (single rating)

Rating	Description of Rating
5	- Motivates the team to do excellent work. - Cares that the team does outstanding work, even if there is no additional reward. - Believes that the team can do excellent work.
4	- Demonstrates behaviors described immediately above and below.
3	- Encourages the team to do good work that meets all requirements. - Wants the team to perform well enough to earn all available rewards. - Believes that the team can fully meet its responsibilities
2	- Demonstrates behaviors described immediately above and below.
1	- Satisfied even if the team does not meet assigned standards. - Wants the team to avoid work, even if it hurts the team. - Doubts that the team can meet its requirements

H = having relevant knowledge, skills, and abilities (single rating)

Rating	Description of Rating
5	- Demonstrates the knowledge, skills, and abilities to do excellent work. - Acquires new knowledge or skills to improve the team's performance. - Able to perform the role of any team member if necessary
4	- Demonstrates behaviors described immediately above and below.
3	- Demonstrates sufficient knowledge, skills, and abilities to contribute to the team's work. - Acquires knowledge or skills as needed to meet requirements. - Able to perform some of the tasks normally done by other team members.
2	- Demonstrates behaviors described immediately above and below.

1	- Missing basic qualifications needed to be a member of the team. - Unable or unwilling to develop knowledge or skills to contribute to the team. - Unable to perform any of the duties of other team members.

Disposition Toward Team Members (each student completed these in reference to each of their team members, Ohland et al., 2012)

Items were responded to using 5 Likert anchors (1 = "strongly disagree", 2 = "disagree", 3 = "neither agree nor disagree", 4 = "agree", 5 = "strongly agree") (Cronbach's Alpha = .83)

Willing to work with them in the future (three ratings)
- I would gladly work with this individual in the future
- If I were selecting members for a future work team, I would pick this person
- I would avoid working with this person in the future [scale reversed]

Personal connection (three ratings)
- I like this person as an individual
- I consider this person to be a friend
- I enjoy spending time with this person

General Team Ratings (not specific to a group member)

Items were responded to using 5 Likert anchors (1 = "strongly disagree", 2 = "disagree", 3 = "neither agree nor disagree", 4 = "agree", 5 = "strongly agree")

Conflict (Jehn & Mannix, 2001)
Relationship conflict (three items)
- How much relationship tension is there in your work group?
- How often do people get angry while working in your group?
- How much emotional conflict is there in your work group?

Process conflict (three items)
- How often are there disagreements about who should do what in your work group?
- How much conflict is there in your group about task responsibilities?
- How often do you disagree about resource allocation in your work group?

Task conflict (three items)
- How much conflict of ideas is there in your work group?
- How frequently do you have disagreements within your work group about the task of the project you are working on?
- How often do people in your work group have conflicting opinions about the project you are working on?

Team Interdependence (Van der Vegt, Emans, & Van De Vliert, 2001) (five items)
- My teammates and I have to obtain information and advice from one another in order to complete our work

- I depend on my teammates for the completion of my work
- I have a one-person job; I rarely have to check or work with others [scale reversed]
- I have to work closely with my teammates to do my work properly
- In order to complete our work, my teammates and I have to collaborate extensively

Interpersonal Cohesiveness (Loughry & Tosi, 2008) (three items)
- Team members like each other
- Team members get along well
- Team members enjoy spending time together

Team Commitment (Carless & De Paola, 2000) (three items)
- Our team is united in trying to reach its goals for performance
- I'm unhappy with my team's level of commitment to the task (Task Commitment) [scale reversed]
- Our team members have conflicting aspirations for the team's performance (Task Commitment) [scale reversed]

Team Attraction (Loughry & Tosi, 2008) (three items)
- Being part of the team allows team members to do enjoyable work
- Team members get to participate in enjoyable activities
- Team members like the work that the group does

References

Carless, S. A., & De Paola, C. (2000). The measurement of cohesion in work teams. *Small group research*, *31*(1), 71-88.

Jehn, K. A., & Mannix, E. A. (2001). The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Academy of management journal*, *44*(2), 238-251.

Loughry, M. L., & Tosi, H. (2008). Performance implications of peer monitoring. *Organization Science*, 19, 876-890

Ohland, M. W., Loughry, M. L., Woehr, D. J., Finelli, C. J., Bullard, L. G., Felder, R. M., . . . Schmucker, D. G. (2012). The comprehensive assessment of team member effectiveness: Development of a behaviorally anchored rating scale for self- and peer evaluation. *Academy of Management Learning & Education*, 11, 609-630.

Van der Vegt, G. S., Emans, B. J., & Van De Vliert, E. (2001). Patterns of interdependence in work teams: a two-level investigation of the relations with job and team satisfaction. *Personnel Psychology*, *54*(1), 51-69.

<u>Instructional materials used in the courses</u>

Biology- Groupwork (including following activities) accounted for 10% of their grade plus 30% of their final exam grade.

Trout, L. (Ed.). (2012). *POGIL activities for high school biology*. Flinn Scientific.

Trout, L. (Ed.). (2012). *POGIL activities for AP biology*. Flinn Scientific.

The lesson development in the resources above were funded by a grant from the Toyota USA foundation and were written and beta tested by experienced POGIL high teachers.

Chemistry- Groupwork (including following activities) accounted for 10% of their grade but did not factor into their final exam grade.

The original activities are currently copyrighted by Wiley, but were largely generated and disseminated on National Science Foundation grants DUE-0231120 (https://www.nsf.gov/awardsearch/showAward?AWD_ID=0231120), 0618746 (https://www.nsf.gov/awardsearch/showAward?AWD_ID=0618746), 0618758 (https://www.nsf.gov/awardsearch/showAward?AWD_ID=0618758), and 0618800 (https://www.nsf.gov/awardsearch/showAward?AWD_ID=0618800). These were modified by the course instructor to increase student's experience in data interpretation.

<u>Initial overall model used to predict course achievement prior to reduction via AIC validation</u>

Course grade point average (GPA) ~ Women + Traditionally underserved student status + Teammates' views of their contributions (initial) + Teammates' views of their interactions with the team (initial) + Teammates' views if their efforts towards keeping the team on task (initial) + Teammates' views of the extent to which the student expected quality work (initial) + Teammates' views if their relevant knowledge, skills, and abilities (initial) + Teammate's willingness to work with the student (initial) + Teammates' social connection to student (initial) + Team relationship conflict (initial) + Team process conflict (initial) + Team task conflict (initial) + Team interdependence (initial) + Team interpersonal cohesiveness (initial) + Team task commitment (initial) + Team task attraction (initial) + Teammates' views of their contributions (final) + Teammates' views of their interactions with the team (final) + Teammates' views if their efforts towards keeping the team on task (final) + Teammates' views of the extent to which the student expected quality work (final) + Teammates' views if their relevant knowledge, skills, and abilities (final) + Teammates' willingness to work with the student (final) + Teammates' social connection to student (final) + Team relationship conflict (final) + Team process conflict (final) + Team task conflict (final) + Team interdependence (final) + Team interpersonal cohesiveness (final) + Team task commitment (final) + Team task attraction (final)