

Comprehensive Instructional Profile Report

Multiple Semesters

May 12, 2022

Participant Name

How to Make the Most of this Report

The purpose of this report is to provide College of Engineering instructors with descriptive, formative feedback about their teaching that they can use as a basis for reflection and to plan subsequent improvements of their teaching. UNL's three recommended inputs for informing teaching excellence are peer review, student survey, and self-reflection. This report provides a place for you to bring two of those three inputs together from a longitudinal perspective. The report includes several semesters of results from peer review (through peer observation) and the Teaching Practices Inventory (TPI). It also includes space to reflect on those results.

The data used to create this report were collected through the Classroom Observation Protocol for Undergraduate STEM (COPUS) and the TPI during the following semesters: F18, S19, F19, S20. The report is divided into the following sections:

1. **Multi-Semester Profile Reflection:** A reflection, to be completed after reviewing the report's contents.
2. **About COPUS:** A brief explanation of COPUS and the data it generates
3. **Your COPUS Results:** Your results from the COPUS observations that have been done in your course to date
4. **Your TPI Results:** Your results from the Teaching Practices Inventory to date
5. **Resources:** Information about how the Engineering and Computing Education Core (ECEC) can help you
6. **Appendix:** More information about COPUS

Throughout the report, comparisons are made between your data and the data the ECEC has collected on other instructors' courses in the College of Engineering. This dataset contains only instructors who have participated in ECEC programs during or after the Spring 2017 semester and does not contain all teaching faculty in the college.

You can maximize the impact of this report by using it as a basis for reflecting on your teaching practices, which is why we have built reflection exercises into the report itself. Additional reflection packets are available at <https://engineering.unl.edu/ecec/resources->

faculty/. If you have any questions about this report or how to interpret its contents, contact [Dr. Markeya Peteranetz](#) or [Dr. Tareq Daher](#).

1. Comprehensive Instructional Profile Reflection

| Question | Thoughts |
|---|----------|
| COPUS | |
| Which cluster(s) were you in? Has this changed over time? | |
| How does your distribution of profiles compare to the college? Are you satisfied with this? | |
| How do the heat maps help you better understand how time is spent during class when you teach? | |
| Have you been trying to make changes that would impact your cluster? If you were trying to change your cluster, why do you think you were or were not successful? | |
| What specific strategies can you try out next time you teach this course to incorporate more active learning, or to incorporate it more consistently? | |

| Question | Thoughts |
|---|----------|
| TPI | |
| How did your average compare to the college average? | |
| Which category/categories was/were your strongest? Weakest? | |
| Have you been trying to make changes to what you do related to any of the TPI categories? If you were trying to make changes, why do you think you were or were not successful? | |
| Which of the recommended practices that you are not doing do you plan to incorporate next time you teach ? | |

2. About COPUS

The Classroom Observation Protocol for Undergraduate STEM (COPUS) is a standardized teaching observation procedure that generates a record of instructor and student behaviors during a class session. In contrast with traditional, unstructured observations where the observer takes notes and shares thoughts on whatever they personally feel is worth discussing, COPUS yields descriptive data on how time in class is used. This more objective approach to observation empowers the instructor to self-evaluate and judge the extent to which their teaching philosophy and goals are reflected in the way they use class time. The standardized and more objective nature of COPUS reduces the risk of differences between the instructor's and observer's teaching philosophies leading to a skewed observation record.

Codes

During an observation, all instructor and student behaviors are assigned codes, of which there are 25 codes. Because of the complexity of teaching and learning, a single event in a classroom is likely to receive multiple codes. The 25 codes can be collapsed into 8 categories (4 for students and 4 for faculty).

For students:

- “Receiving” indicates listening and/or taking notes.
- “Working” indicates individual thinking or problem solving, working in groups, making predictions about a demonstration or experiment, or taking a test or quiz.
- “Talking” indicates answering a question alone or in groups, asking a question, engaging in whole-class discussion, or giving a presentation.
- “Other” covers any time students spend waiting (interruptions, technical problems, etc.) as well as any other behaviors that do not fit into the resting of the coding scheme.

For faculty:

- “Presenting” indicates lecturing (with slides, while writing on the board, or neither), conducting a demonstration or experiment, or showing a video.
- “Guiding” indicates following up with the whole class on a question or activity, asking a question, answering a student question, moving around the class while students work, or working one-on-one with one or a few students.
- “Administrative” indicates any administrative tasks like taking attendance, returning homework, etc.
- “Other” indicates waiting without interacting with or intentionally observing students as well as any other behaviors that do not fit into the resting of the coding scheme.

Profiles

COPUS data can be used to identify the “type” of teaching and learning that took place during a class. Using thousands of observation records from STEM classes, Marilyn Stains and her colleagues identified seven different clusters that they grouped into three categories (see Appendix for more information about each cluster).

1. **Didactic Instruction:** This mode of instruction contains around 80% lecture with minimal student involvement. There may be sporadic questions to and from students, and students may occasionally be asked to work as a group to answer instructor questions.
2. **Interactive Lecture:** This mode of instruction supplements lectures with student-centered strategies. There are questions to and from students, and students work together to answer questions, solve practice problems, or work on other activities.
3. **Student Centered:** This mode of instruction relies less heavily on lecture, but lecture might still be a prominent part of the class. Lecture is supplemented with student-centered strategies such as group work, questions to and from students, and one-on-one support from the instructor.

The ECEC has set a college goal to have at least two-thirds of course sessions be classified as Interactive Lecture or Student Centered.

More details about COPUS and the profiles are given in the Appendix.

3. Your COPUS Results

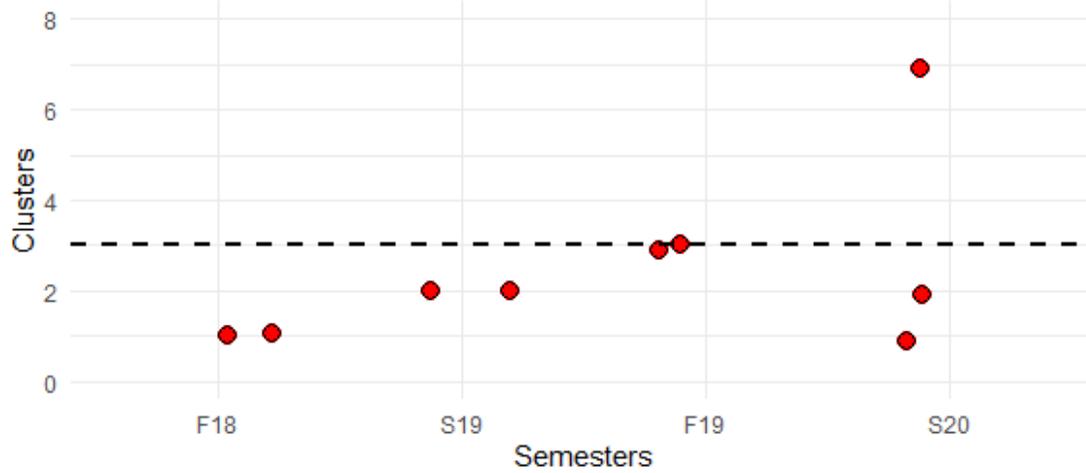
These results are based on your instruction in *class 1*, *class 2*, *class 3*, and *class 4* in the semesters F18, S19, F19, and S20.

Instructional Profiles

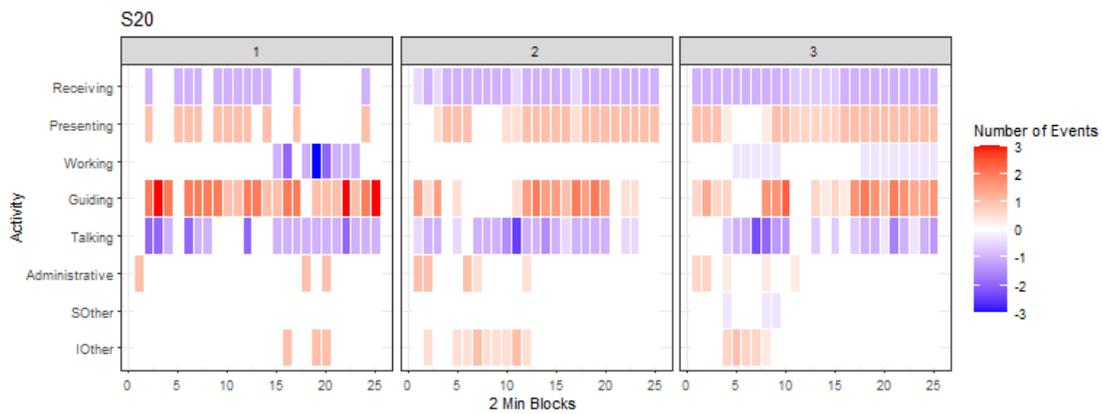
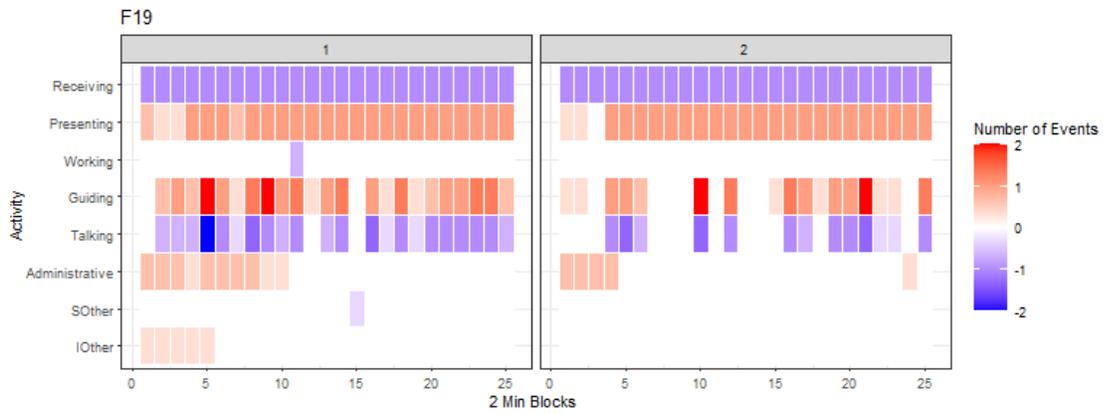
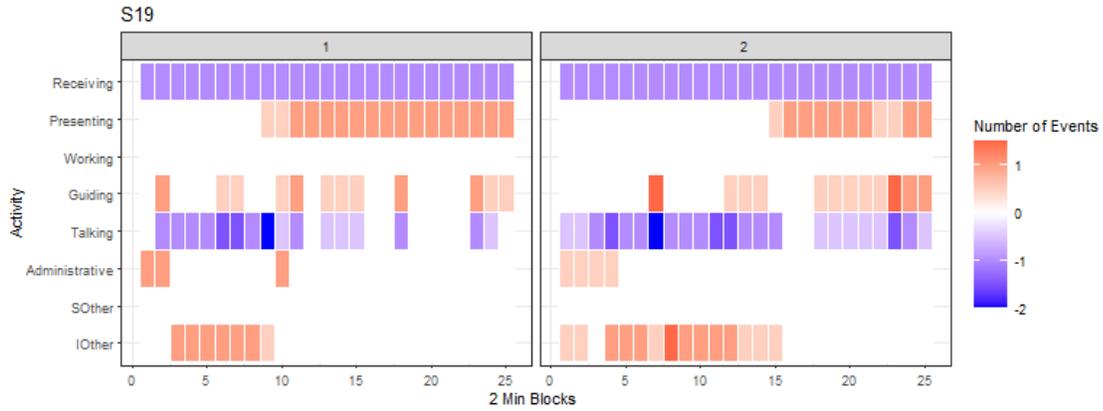
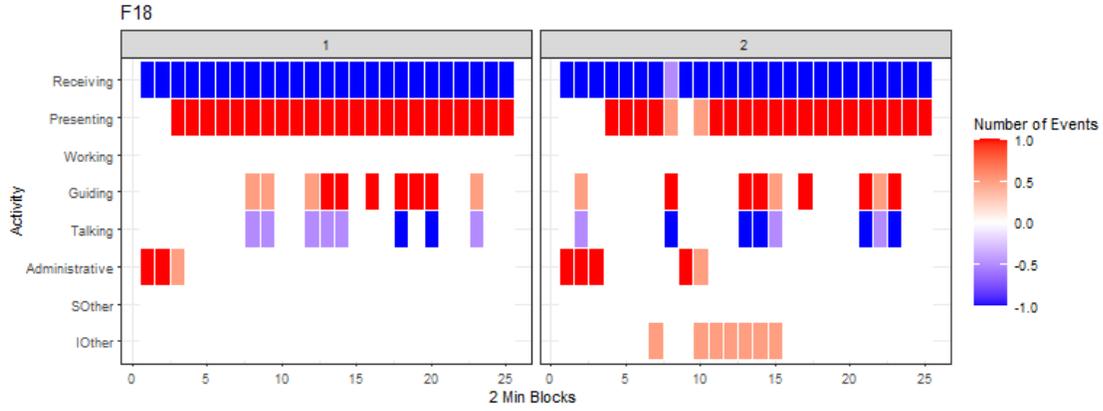
You have been observed **9 times** over **4 semesters**. Your observed course sessions were classified as clusters 1, 1, 1, 2, 2, 2, 3, 3, and 7.

The next figure shows your profile classification for each observation over the terms during which you have been observed. The dashed horizontal line at $y = 3$ represents our goal of having at least two thirds of course sessions across the college classified at 3 or above. **So far 33.3% of your observed classes have been classified as 3 or above.** The ECEC can support your efforts to meet this goal.

Your Profiles across Semesters



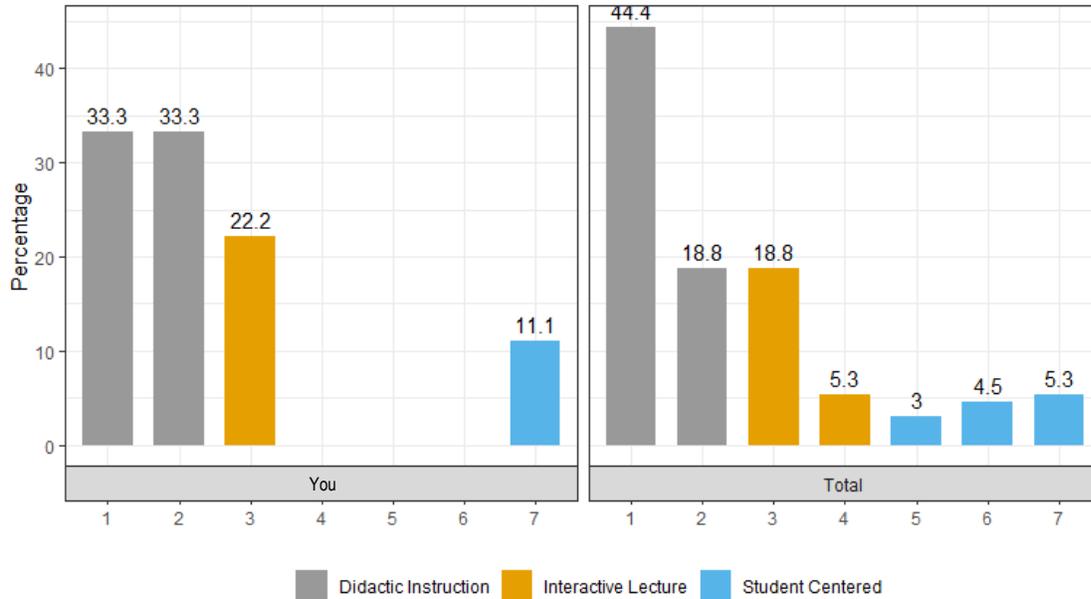
The next set of figures are heatmaps for all COPUS observation data that has been generated from your courses. Each of the 4 columns shows a semester's observation data. Student activities are shown in blue/purple, and instructor activities are shown in red/orange. Darker shading indicates more activities from that category occurred during the 2-minutes period.



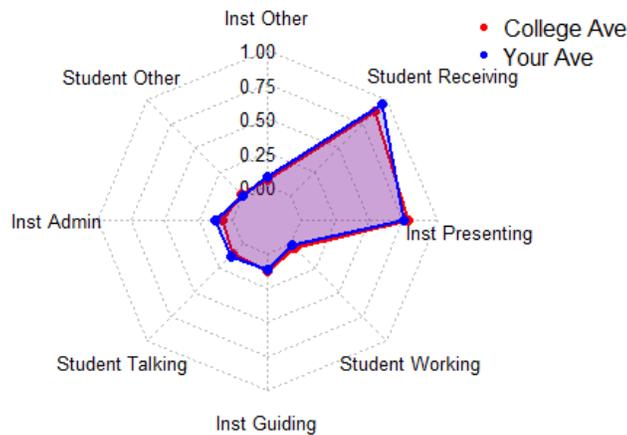
The next two figures show COPUS results for you compared to all participating faculty in the College of Engineering. The first figure shows your distribution across the seven COPUS profiles compared to the distribution across profiles for all College of Engineering faculty who have participated in our peer observation programs. The second figure shows the proportion of class time spent on each type of activity for you and the college as a whole.

Distribution of Profiles

All Semesters



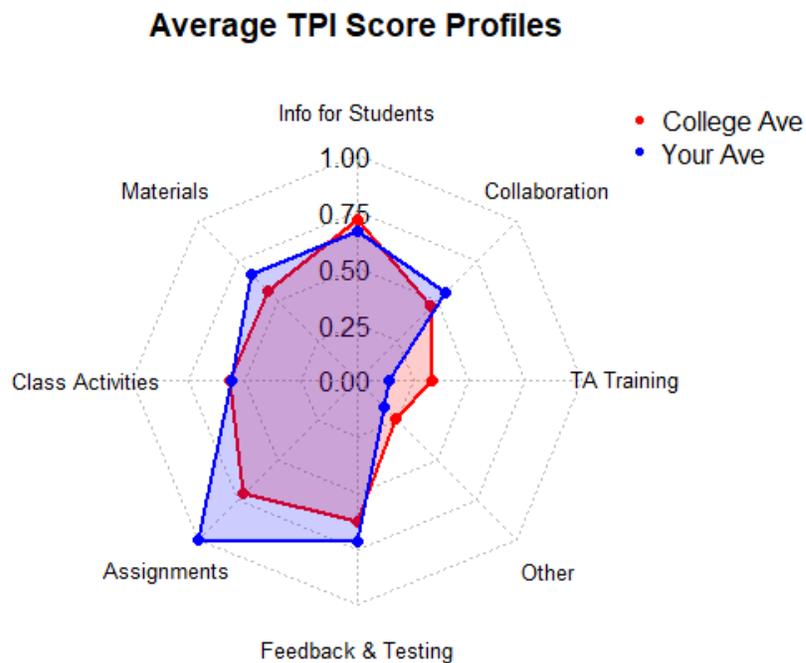
Average for COPUS Categories



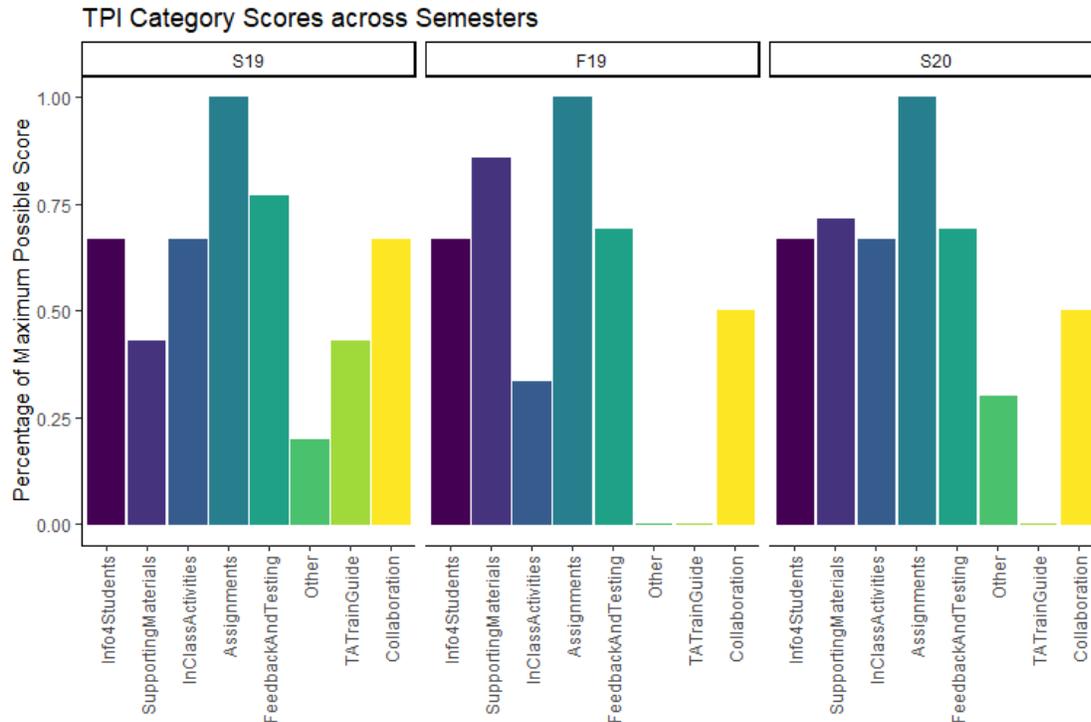
4. Your TPI Results

The Teaching Practices Inventory is a tool intended to facilitate instructors' reflection on their teaching. It has been tested with several hundred university instructors in STEM fields. You can view [all questions in the TPI here](#). Keep in mind that no single course is expected to incorporate all of the things listed in the TPI and there is no single formula for high-quality instruction. Additionally, the TPI does not include all evidenced-based teaching practices, especially practices that are discipline specific. We encourage you to use these results as a starting point for thinking about the ways in which you are providing strong support for your students as well as the ways in which you could expand your current practices.

The next chart shows a high-level comparison of how each of your responses to the TPI compare to those of other faculty in the college. The scoring of the TPI gives more weight to practices that are shown by research to be more beneficial to student learning. The perimeter of the chart represents the maximum possible value for each category.



This next figure shows differences in your TPI category scores across the different semesters. Keep in mind that you probably did not teach the same course during each of these semesters.



5. Resources

Contact the ECEC:

Email us at enr-ecec@unl.edu or visit [the ECEC website](#)

Our Instructional Designers can help you:

- incorporate more evidence-based strategies into your courses
- design, develop, implement, and evaluate new learning activities and innovative pedagogies
- integrate instructional technology into your teaching to enhancing learning

Our Learning Assessment Coordinator can:

- review your classroom assessment processes and provide recommendations
- teach you how to evaluate the quality of your classroom assessments
- help you develop new classroom assessments

Our ongoing faculty programs include:

- Faculty Teaching Fellows Program - engage in a variety of activities over multiple years that will help you improve your teaching and build relationships with other faculty focused on teaching excellence

- Learning by Design - learn the Backwards Design process as you develop or redevelop a course
- Peer Observation of Classroom Activities (POCA) - get feedback on your teaching and learn about how other instructors in the college approach teaching

6. Appendix

About COPUS

Smith et al. (2013) developed a teaching observation procedure known as the Classroom Observation Protocol for Undergraduate STEM (COPUS). This protocol allows STEM faculty, after a short 1.5-hour training period, to reliably characterize how faculty and students are spending their time in the classroom.

Observers attend a course for 50 minutes and used a COPUS form to mark instructor and student behaviors in 2-minute intervals using a spreadsheet like the one pictured below.

| Date: | | Class: | | Instructor: | | No. students: | | Observer Name: | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------------|--------|----|-------------|----|---------------------|----|----------------|----|----|---------------|---|---|--|-----|------|----|----|----|-----|----|----|----|-----|---|---|---|---|---|--|
| Classroom arranged how? | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. L-Listening, Ind-Individual work, CG-Clicker Q discuss, WG-Worksheet group work, OG-Other group work, AnQ-Answer Q, SQ-Student Q, WC-Whole class discuss, Pr-Predicting, SP-Student present, TQ-Test/quiz, W-Waiting, O-Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Lec-Lecturing, RW-Writing, FU-Follow-up, PQ-Pose Q, CQ-Clicker Q, AnQ-Answer Q, MG-Moving/Guiding, Oo-One-on-one, DV-Demon, Adm-Admin, W-Waiting, O-Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| For each 2 minute interval, check columns to show what's happening in each category (or draw vertical line to indicate continuation of activity). Check in type columns where appropriate. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COPUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| min | 1. Students doing | | | | | 2. Instructor doing | | | | | 3. Engagement | | | Comments: EG- explain difficult coding choices, flag key points for feedback for the instructor, identify good analogies, etc. | | | | | | | | | | | | | | | | |
| | L | Ind | CG | WG | OG | AnQ | SQ | WC | Pr | SP | TQ | W | O | | Lec | (RW) | FU | PQ | CQ | AnQ | MG | Oo | DV | Adm | W | O | L | M | H | |
| 0-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

The protocol has three types of codes. The codes and what they signify are main parts as listed below:

1. Students are Doing

- L Listening to instructor/taking notes, etc.
- Ind Individual thinking/problem solving. Only mark when an instructor explicitly asks students to think about a clicker question or another question/problem on their own.
- CG Discuss clicker question in groups of 2 or more students
- WG Working in groups on worksheet activity
- OG Other assigned group activity, such as responding to instructor question
- AnQ Student answering a question posed by the instructor with rest of class listening
- SQ Student asks question
- WC Engaged in whole class discussion by offering explanations, opinion, judgment, etc. to whole class, often facilitated by instructor
- Prd Making a prediction about the outcome of demo or experiment
- SP Presentation by student(s)
- TQ Test or quiz
- W Waiting (instructor late, working on fixing AV problems, instructor otherwise occupied, etc.)
- O Other – explain in comments

2. Instructor is Doing

- Lec Lecturing (presenting content, deriving mathematical results, presenting a problem solution, etc.)
- RtW Real-time writing on board, doc. projector, etc. (often checked off along with Lec)
- FUp Follow-up/feedback on clicker question or activity to entire class
- PQ Posing non-clicker question to students (non-rhetorical)
- CQ Asking a clicker question (mark the entire time the instructor is using a clicker question, not just when first asked)
- AnQ Listening to and answering student questions with entire class listening
- MG Moving through class guiding ongoing student work during active learning task
- 1o1 One-on-one extended discussion with one or a few individuals, not paying attention to the rest of the class (can be along with MG or AnQ)
- D/V Showing or conducting a demo, experiment, simulation, video, or animation
- Adm Administration (assign homework, return tests, etc.)
- W Waiting when there is an opportunity for an instructor to be interacting with or observing/listening to student or group activities and the instructor is not doing so
- O Other – explain in comments

3. Student Engagement (optional)

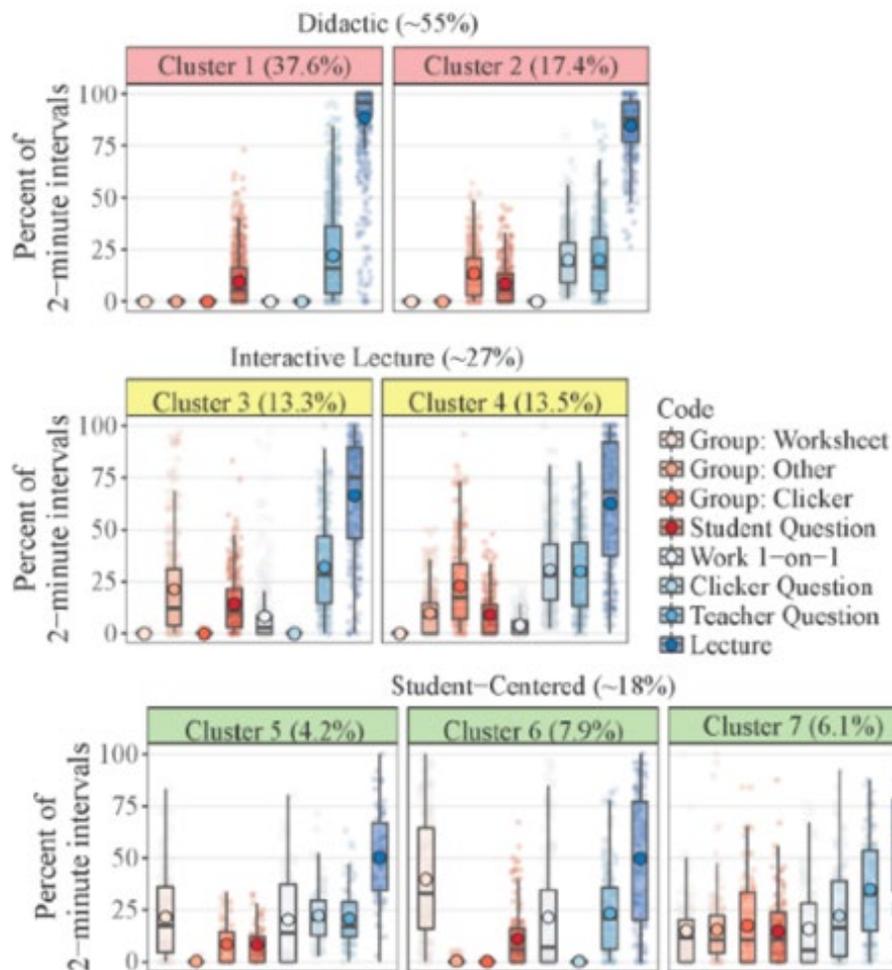
- L Small fraction (10-20%) obviously engaged.
- M Substantial fractions both clearly engaged and clearly not engaged.
- H Large fraction of students (80+% clearly engaged in class activity or listening to instructor.

Student engagement alternatives:

- (1) Just mark when engagement is obviously high or obviously low.*
- (2) Count "N" students near you (~10) and assess how many appear engaged at every 2 minute interval. Enter value for all engaged instead of L/M/H. NOTE what your value of N was.*

Instructional Profiles

Based on Stains et. al (2018)'s research, analysis of COPUS observations results in three main categories (Instructional Profiles) represented by 7 clusters as shown below.



Didactic Instruction Clusters

- Cluster 1 falls under Didactic Instruction. This mode of instruction contains around 80% lecture with minimal student involvement. Cluster 1 has no observed student involvement except sporadic questions from and to the students.
- Cluster 2 falls under Didactic Instruction. This mode of instruction contains around 80% lecture with minimal student involvement. Cluster 2 has clicker questions that are sometimes associated with group work.

Interactive Lecture Clusters

- Cluster 3 falls under Interactive Lectures. This mode of instruction supplements lectures with student-centered strategies. Cluster 3 might contain clicker questions that are sometimes associated with group work.

- Cluster 4 falls under Interactive Lectures. This mode of instruction supplements lectures with student-centered strategies. Cluster 4 represents lectures with clicker questions and group work.

Student-Centered Clusters

- Cluster 5 falls under Student Centered Instruction. This mode of instruction supplements lectures with student-centered strategies, primarily through group worksheets and questions and one-on-one assistance from the instructor.
- Cluster 6 falls under Student Centered Instruction. This mode of instruction supplements lectures with student-centered strategies in large portions, primarily through group worksheets and assistance and questions from the instructor.
- Cluster 7 falls under Student Centered Instruction. This mode of instruction supplements lectures with student-centered strategies in large portions. Cluster 7 is defined as represents a variety of group work strategies with less consistent usage.

References

Smith, M. K., Jones, F. H., Gilbert, S. L., & Wieman, C. E. (2013). The Classroom Observation Protocol for Undergraduate STEM (COPUS): A new instrument to characterize university STEM classroom practices. *CBE—Life Sciences Education*, 12(4), 618-627.

Stains, M., Harshman, J., Barker, M. K., Chasteen, S. V., Cole, R., DeChenne-Peters, S. E., ... & Young, A. M. (2018). Anatomy of STEM teaching in North American universities. *Science*, 359(6383), 1468-1470.