CAFE Workshop: Partnering with Students to Foster Peer Learning

Part 1: Intro to Peer Learning
- What is peer learning?
  - A collection of educational approaches that help students solidify their knowledge by teaching each other
- Why does it work?
  - Supported by empirical research and the learning theory of social constructivism
  - Offers academic, social, and emotional benefits to students
  - Works best when professors understand the pedagogy, consciously apply it, and make the learning process explicit for students

Part 2: Types of Peer Learning

Type 1: peer learning in class (no extra assistants)

official site   *Process Oriented Guided Inquiry Learning* (POGIL)

POGIL is a research-based, student-centered instructional approach that's been used for 20 years starting in STEM and slowly expanding. In a typical POGIL classroom or lab, students work in small, self-managed teams with the instructor acting as a facilitator. The student teams use specially designed interactive activities that guide them to construct their own understanding of key concepts, and at the same time to develop important process skills such as communication, critical thinking, and problem solving.

more info   *Student-Centered Active Learning Environment with Upside-down Pedagogies* (SCALE-UP)

POGIL and many of the following activities are often used with SCALE-UP classroom designs, in which the physical classroom space is restructured to de-center the professor and facilitate peer collaboration on short, interesting tasks.

official site   *Project Based Learning* (PBL)

"Students work on a project over an extended period of time – from a week up to a semester – that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by creating a public product or presentation for a real audience. As a result, students develop deep content knowledge as well as critical thinking, collaboration, creativity, and communication skills." Evaluated extensively in the literature.

more info   *Inquiry-based (collaborative) learning*

Inquiry-based learning has students solve a daily-life problem by doing research and allows students to learn collaboratively with their peers by engaging in learning activities with them. Can be done in class or in labs and has been evaluated extensively in the literature.

more info   *Peer instruction* (PI)

Peer instruction involves the following specific steps:
- The instructor poses a conceptual question to probe students' understanding on a topic just covered by lecture or pre-class reading.
- The instructor gives students one to two minutes to think and then asks them to record their individual responses either on paper or via a technology tool like Google or iClicker Cloud. These can be collected or not.

CAFE Workshop: Partnering with Students to Foster Peer Learning

- The instructor asks the students to discuss the reasoning behind their responses with their neighbors and to explore any differences in their answers (2-10 minutes); the instructor may move around the room listening to the student discussion.
- Once discussion is completed, the instructor repeats the question and collects the new responses.
- Finally, the instructor provides immediate feedback on the results and explains the correct answers or asks volunteers to clarify any remaining confusion

official site

Team-Based Learning ™ (TBL)

"Team-Based Learning is an evidence-based collaborative learning teaching strategy designed around units of instruction, known as "modules," that are taught in a three-step cycle: preparation, in-class readiness assurance testing, and application-focused exercise. A class typically includes one module.

- "Students must complete preparatory materials before a class or the start of the module. Materials may be text, visual, or other, and set at a level that is appropriate to the students and the course.
- "[In class,] Students complete an individual readiness assurance test (IRAT), consisting of 5 to 20 multiple choice questions. After submitting their individual answers, […] they take the same test, the team RAT (TRAT), with their team. As a team they use scratch cards (IF-AT cards), hoping to find a star that indicates a correct answer. All members of each team share the same TRAT score, and both IRAT and TRAT scores count toward the students' grades.
- "The remainder of the session or module is taken up with exercises that help students learn how to apply and extend the knowledge that they have pre-learned and tested. Teams are given an appropriate problem or challenge, and must arrive at a consensus to choose a "best" solution out of options provided. Teams then display their answer choice, and the educator facilitates a classroom discussion between teams to explore the topic and the possible answers to the problem."

more info

Peer assessment/Peer review

"Peer assessment or peer review provides a structured learning process for students to critique and provide feedback to each other on their work. It helps students develop lifelong skills in assessing and providing feedback to others, and also equips them with skills to self-assess and improve their own work." While peer review is most common in composition and creative writing classes, peer review can be used in any class that has papers/writing for students to read one another's writing with a scoring rubric in mind and discuss feedback with one another in order to help both learn to write or explain content in writing more effectively.

more info

Cooperative learning

- "Cooperative learning involves structuring classes around small groups that work together in such a way that each group member's success is dependent on the group's success. There are different kinds of groups for different situations, but they all balance some key elements that distinguish cooperative learning from competitive or individualistic learning.
- "Cooperation is not having students sit side-by-side at the same table to talk with each other as they do their individual assignments […or] assigning a report to a group of students where one student does all the work…. […] There is a crucial difference

between simply putting students into groups to learn and in structuring cooperative interdependence among students."

- Example activities:
  ° Jigsaw: In the jigsaw method of peer learning, students are split into groups, with each group given a different topic to study. Then, one student from each group is taken to form a collaborative group where multiple concepts are discussed. If there are eight jigsaw groups, then eight topics will ultimately be discussed in one group.
  ° Peer review: described in the prior peer learning approach above.
  ° Large project: Assign to student groups a learning task that a student cannot accomplish alone in a reasonable length of time. These projects are often interesting or real-world-based and can teach more than simplified versions.

[more info]   *Cooperative vs. collaborative learning*

"Unlike collaborative learning, which is designed for self-directed learning and exploration, cooperative learning is organized around structured projects or activities. While collaborative learning teams can work independently and combine their contributions, cooperative groups meet face to face and their work is assessed both individually and as a team."

Type 2: peer learning in class with assistant(s)

Course assistants
A general term, course assistants are more advanced students who support student learning in courses. The role may include helping in class (e.g. embedded tutors; see below) and/or outside of class (e.g. mentoring students outside of class or through first-year mentoring programs).

Teaching assistants (TAs)
Another general term used through higher education to refer to more advanced students who assist the course instructor in classes and labs to support student learning or to take care of tasks like lab prep and grading.

[more info]   *Embedded tutoring*

Often included with supplemental instruction (see below), embedded tutoring has many versions, but its essence is that past successful students of a class attend that class to help current students learn more effectively. Faculty often combine embedded tutoring with group or team-based classroom activities and pedagogies.

[official site]   *Learning Assistants* (LAs)

"Learning Assistants are undergraduate students who, through the guidance of weekly preparation sessions and a pedagogy course, facilitate discussions among groups of students in a variety of classroom settings that encourage active engagement." Has been extensively assessed.

CAFE Workshop: Partnering with Students to Foster Peer Learning

Type 3: peer learning outside of class

official site   *Supplemental Instruction*® (SI)

"Supplemental Instruction (SI), created at the University of Missouri-Kansas City, is a non-remedial approach to learning that supports students toward academic success by integrating 'what to learn' with 'how to learn.' SI consists of regularly scheduled, voluntary, out-of-class group study sessions driven by students' needs. Sessions are facilitated by trained peer leaders [past successful students] who [attend lecture classes, confer with the professor, and] utilize collaborative activities to ensure peer-to-peer interaction in small groups. SI is implemented in high-risk courses in consultation with academic staff."

more info   *Peer-led team learning* (PLTL)

"Along with Problem-Based Learning (PBL) and Process-Oriented Guided Inquiry Learning (POGIL), PLTL emerged from the theory of social constructivism, which argues that learners must rigorously cultivate their own knowledge through collaboration with others. Under this framework, PLTL engages [the same] 6-8 students in 90-120 min of cooperative problem solving each week [required attendance, integral to the course], with facilitation from a trained peer leader who previously succeeded in the associated course." This leader receives materials from a supervisor and, unlike SIs, doesn't sit in on lecture classes. "Focusing specifically on PLTL, a recent review found that STEM courses accompanied by PLTL elicit greater student success than courses without them, at least when the PLTL implementation effectively fosters collaborative group-work."

ONU page   *General peer tutoring*

Peer tutoring takes many forms but may include drop-in tutoring, private tutoring, mentoring, sorority/fraternity members helping other members, student-generated study groups, etc.

Activity 1: Form groups of 4 (preferably with people whose classroom instruction choices are unknown to you) and discuss the following questions:
- We've classified peer learning into 3 types: peer learning in class (no extra help), peer learning in class with assistants, and peer learning outside of class time. Which type(s) have you tried? What activities have you used? Which activities are most robust? What are their challenges? Which type would you like to try?
- What are you doing in your classes now related to peer learning and how is it going? What problems have you had? How have you handled those?
- If you'd like to try something new, which one of the above examples sounds like something you could implement? What would you need to adjust to make that happen?
  Notes:

CAFE Workshop: Partnering with Students to Foster Peer Learning

Part 3: Faculty Feature: Peer Learning Examples at ONU
- Emily Eddy: PASS: TAs, embedded tutors, and SI in pharmacy
- Matthew Lambdin: course assistants in business TREX class
- Amelia Anderson-Wile and Hannah Sturtevant: O-chem and gen chem SI and embedded tutoring
- Q/A time
  Notes:

Activity 2: Ponder/discuss the last three questions below:
- What are your takeaways from today?
- What is one thing you could do differently or in addition to what you are currently doing now in/outside class related to peer learning?
- Do you have an interest in SI? Come chat with us :)
  Notes:

Follow this link to Peer Learning Resources, a Google Drive repository for faculty. This repository is a work in progress. We will continue adding resources on the different types of peer learning.

Follow this link to tell us about peer learning in your classroom or if you are willing to be a resource for other faculty interested in doing the type of peer learning you're doing.

Follow this link if you are interested in implementing or expanding peer learning in your classes.