Unlocking the Power of Collaboration

an initiative of the Charles A. Dana Center and the Texas Association of Community Colleges

Opening reflection

Did you do the previous module? If you did the previous module, please discuss the following 3 questions:

▪ How did you engage in the suggested reflection and follow-up?
▪ How have you been incorporating changes into your teaching?
▪ How is it going?
Professional learning in a virtual environment

Everyone is responsible for helping to make an inclusive and productive learning space.

Before going further in the module, please establish or revisit your norms for working together.

Video

Use this space for notes

Slide 3: Norm Setting

Slide 4: Student voice: Kaleena
Session participants will learn ...

1. The value of collaboration.
2. How to use pairs, groups, and whole-class structures.
3. Strategies for organizing groups for learning and functioning.
4. That collaboration is a complex skill; teaching students to learn through collaboration takes purposeful effort.

The value of collaboration

Definition of collaborative activities

For the purposes of this module, **collaborative activities** are defined as activities in which students work together in pairs or groups of three or four.

The students are interacting in these activities without direct ongoing facilitation by teachers.
The value of collaboration

How collaboration fosters learning

Communication and justification provide opportunities to engage prior knowledge.

Students then engage in sensemaking, conjecturing, explaining, and critiquing to develop their understanding.

These activities prepare students to:

- Connect their thinking with other approaches
- Grasp the lesson target
- Comprehend the lesson summary

The value of collaboration

How collaboration fosters the learning of mathematics

When students are working with others to understand mathematics, they:

- Clarify their own thinking
- Articulate ideas to others who can extend the reasoning or point out misconceptions
- Consider different ways of thinking about or solving a problem
- Explain strategies used and justify solutions offered
- Compare solution strategies for accuracy and utility
- Relate to previous problems and topics to make connections
The value of collaboration

How collaboration fosters the learning of mathematics

- People working on complex problems in groups, with thoughtful and appropriate scaffolding, can often reach a deeper and more lasting understanding than can people working independently.

- Groups can often come up with better solutions than can individuals.

- Collaboration is not a simple sharing of knowledge from more-skilled to less-skilled students. Explaining is an opportunity to learn. All who participate actively benefit.

The value of collaboration

Social value of collaboration

Collaborative activity fosters an environment of shared responsibility for learning.

Students support each others’ understanding and become invested in the success of their classmates.

Students learn social practices that are essential to mathematical understanding, such as effectively
  - Communicating ideas
  - Critiquing the work of others
The value of collaboration

Turn and talk

Consider your own experiences of learning through collaboration.

1. What was the context?

2. How did the collaboration help you learn?

3. How did the group help you maintain consistent effort over an extended period of time?

The value of collaboration

What to listen for in the video

You are about to watch two student interviews.

As you watch, identify the value the students derived from collaborating and the features of the classes that made that collaboration possible.

Slide 11: Turn & Talk Activity: Your own experiences

Slide 12: Listening to student voices
Unlocking the Power of Collaboration - Slides Handout

Video
Use this space for notes

Slide 13: Student voice: Travis

Video
Use this space for notes

Slide 14: Student voice: Elizabeth
The value of collaboration

Turn and talk

1. What connections did you hear between the two interviews?

2. How do the experiences described in the videos relate to your experiences collaborating with others?

3. Do these experiences resonate with your experience using groups in the classroom?

How to use pairs, groups, and whole-class structures

Benefits of pairs and groups / When to use each

- **Pairs** maximize the number of students who get to talk and share their thinking. Pairs can also increase the students' sense of safety by letting them talk to a single person before sharing with a larger group.

- **Groups** of the three and four can expose students to a variety of ways of thinking. Students in groups are able to tackle more complex problems. (Groups larger than four often struggle to organize tasks, manage skills, and reach consensus.)

- When students work together, they still need opportunities to think alone and reflect.
How to use pairs, groups, and whole-class structures

When to use a whole-class structure

Whole-class discussions are useful:
• At the beginning of an activity for class direction.
• When groups are stumbling at the same point in an activity.
• At the end of an activity to uncover connections between multiple solution strategies.

Common structures for pairs

Ask students to turn to a partner and talk about:
• Ideas for how to approach a new problem.
• An area of confusion that has emerged during a whole-class discussion.
• An important idea that was shared by a student or group.

You can also give pairs completed work and ask them to analyze the methods and accuracy.

These structures help activate prior knowledge, provide formative assessment, and crystalize important concepts.
How to use pairs, groups, and whole-class structures

**Common structures for groups**

Place students into assigned groups of 3 or 4 to:

- Tackle complex problems that are worthy of concentrated group effort.
- Develop presentations that communicate strategies and concepts.
- Explain/compare solutions completed in pairs.

**Characteristics of group-worthy problems**

Problems that are group-worthy:

- Are contextualized.
- Require modeling.
- Are open-ended.
- Have multiple paths to solutions.
How to use pairs, groups, and whole-class structures

Analysis task: Group-worthy problems

In the prereadings, you reviewed student activities from the Dana Center’s *Foundations of Mathematical Reasoning* course. Each pair or group should have a copy of the activities.

You facilitator will assign each pair or group two activities to use in the task. The instructions for the task are on the next page.

1. Examine the activities and determine which ones you think are most suitable for individual, pair, or group work. Provide justification for your decisions.

2. Design ways that you might use pairs or groups in your implementation of these activities. What would you ask students to do?

3. Create the prompts you would give to students and be prepared to explain your reasoning about how you think these prompts will support the interactions that promote learning.

Discussion:
Share the work of your collaboration with the rest of your colleagues. Try to make connections between the different approaches used and draw some generalized conclusions about collaboration.
Strategies for organizing groups

Goals for forming groups and pairs

- Communicate the expectation that every student can collaborate with every other student.
- Create a safe space for conjecture, questioning, and critique.
- Collaboration is like teamwork—all members must be allowed to contribute in meaningful ways.

Goals for forming groups and pairs

- Groups should be heterogeneous (or mixed-ability).
- Students should sit in groups throughout the class meeting (rather than sitting in rows).
- Outcomes for group work activities should be specified.
- Every group and each person in every group should be held accountable.
- No groups larger than four.
- Assign groups (self-selection can undermine the expectation that all students can collaborate successfully with all others).
- If one group is malfunctioning and interventions are not successful, reshuffle the whole class (to maintain expectations regarding collaboration).
Strategies for organizing groups

Instructional decisions

Instructors must make many decisions based on how a particular collaboration is developing, student behavior and needs, and the goals of a particular task. Some of these decisions include:

- How to form groups.
- How often to change groups.
- When and how to assign and structure roles in groups.

Teaching students to learn through collaboration

Collaboration is a complex skill

- Students need to understand why they are asked to collaborate.
- Students need support to develop skills over time.
- Collaboration should be introduced early and intentionally scaffolded throughout the course.
- An initial activity should be strategically designed to introduce collaboration and to enable students to experience early success.
Teaching students to learn through collaboration

Characteristics of initial activity

The initial activity should …

Be mathematically challenging AND scaffolded so that all students can experience some level of success.

Include an engaging context or problem that leads to meaningful learning.

Set clear expectations for interaction and products.

Provide multiple entry points that allow all students to engage in the problem in different ways.

Require students to talk and work together.

Include peer-to-peer and whole-class discussion.

Help break down barriers.

What to look for in the video

The instructor in the following video talks about doing collaborative activities the first day of class and setting expectations for collaboration the first day.

Slide 27: Characteristics of initial activity

Slide 28: Listening to faculty voices
Teaching students to learn through collaboration

Discussion
Think-pair-share

In the video, the teacher talks about the challenges and benefits of collaborative learning throughout the semester. She discusses the beginning of the semester. What challenges and benefits do you find at other points in the semester, in particular the middle and the end?

Think about your answers, discuss them with a partner, and then share them with the other participants.
Teaching students to learn through collaboration

Process and expectations will change over time

These are some examples of how tasks and supports can be scaffolded over time:

- Less support and more challenge as the semester progresses.
- Fewer check-in points with the instructor.
- More sophisticated solution methods.

Establishing productive norms is an ongoing process

Collaboration is maximized when all students take responsibility for helping to make an inclusive and productive learning space.

Instructors must make these goals clear and reward the behaviors when observed.

In the next section, you will discuss strategies to develop and support productive norms for collaboration.
**Teaching students to learn through collaboration**

**Inclusive groups: A shared responsibility**

The instructor should ensure that all members of the group understand the task, have access to the materials, and are following the discussion.

Students have a collective responsibility to invite and encourage each participant to share their ideas.

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**Teaching students to learn through collaboration**

**In productive groups, the individuals ...**

- Give reasons and evidence to challenge ideas presented.

- Place learning materials (tables, graphs, equations, other tools) in the middle of the group where all can see and work with them.

- Check to make sure that all members of the group are following the discussion.
Teaching students to learn through collaboration

In productive groups, the individuals …

- Try to understand each idea presented and ask questions to help speakers make their ideas clear.

- Learn to ask for evidence (e.g., Why do you think that? How do you know? You said “increasing”; can you show me where you see increase on the graph?)

- Ask for limitations (Is that always true? What if the numbers were negative?)

- Try to connect to what has been said previously and build on or improve those ideas (e.g., I agree the slope is 3, but we need to find the constant too).

Teaching students to learn through collaboration

Think-pair-share

Reflect on your own experiences for 2 minutes and answer the following questions. Find a partner to share the most important realizations.

1. What helps you become comfortable working with people you do not know?
2. What has contributed to making collaboration successful for you?
3. What were the sources of those factors?

Spend 1 minute sharing, 1 minute listening, and 1 minute synthesizing.

(activity continued on next slide)
Teaching students to learn through collaboration

Group discussion

Each pair should find another pair to form a group.

• Share the results of your synthesis with the others in your group.

• How do you think students will cope with similar challenges?

• Discuss what you can do to support students.

Create a list of specific strategies, structures, and teacher moves that you think might help and that you would be willing to try.

More learning about supporting collaborative activities

In this module, you learned that collaborating is a complex skill that is developed over time with support.

Learning to use collaboration as an instructor is similarly complex and takes time and persistence to develop mastery.

The next module in this series covers additional collaborative learning topics.
Unlocking the power of collaboration

Turn and talk: Reflection

This module attempted to model the collaborative learning techniques and concepts described.

In what ways did you see the modeling in the module?

How can you apply what you experienced in this module when you are in your classroom?

Reflection and follow-up

Right now:
- For your own purposes, not to be shared with the group, take a few minutes to summarize the new ideas you generated.
- Discuss as a group a few new techniques you will incorporate into your teaching before the next workshop.

Over time:
- As you try new techniques, make note of your experiences.
- Find opportunities to discuss your experiences with colleagues.
- After experimentation, journal about which practices, if any, you are considering adopting.