Complex Instruction

In an upper elementary classroom

Complex Instruction

What is Complex Instruction? According to its Stanford based website, “complex instruction offers a complex and ambitious pedagogical approach to create equitable classrooms. It emphasizes equal-status interactions among students and specifies the conditions under which teachers can establish and support such interaction.”

In simpler terms, Complex Instruction is an equitable group work approach that emphasizes the use of tasks that need all students working cohesively to be accomplished. To successfully implement into the classroom, norms and student status needs to be addressed prior to introducing tasks. Discuss the multiple-abilities needed to complete tasks and utilize group roles to ensure equitable participation.

Preparing for Complex Instruction

When preparing for Complex Instruction, it is important to note the idea that participation needs to be equitable. Often over participation from other students prohibit the participation of others. The first approach of Complex Instruction is to focus on participation amounts instead of ability. Think of how students participate and not if they are “low or high”. Share with your students the importance of math competence and what is considered ‘smart’ in math. When students realize there are numerous ways to be smart, status levels begin to change in the classroom.

Math status of students are socially determined by the classroom community. Students with low status are typically pushed out of group work due to peers impressions of their math abilities. To combat this, share the numerous abilities needed to complete tasks. Students will see how many variations of smartness is needed to successfully complete the task. In addition, teach group norms such as only accepting group questions, teaching students the power of yet, and teaching no one is finished until everyone understands.

Components to successfully implementing Complex Instruction

Multiple-abilities Treatment

Complex instruction entails using group tasks that are too challenging to be completed by one student. Pulling on each others strengths will be how students achieve. Multiple-abilities treatment should be used prior to complex instruction tasks. Students first identify their strengths and then the task is introduced as needing different strengths in order to be completed.

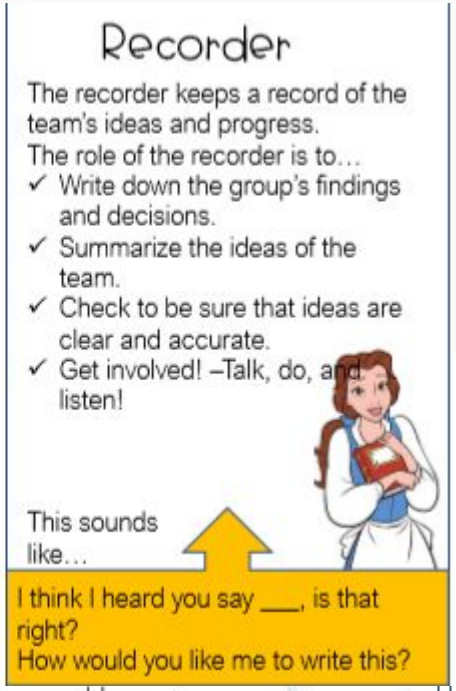
It is essential that students understand they will have strengths and weakness in all areas of math. They need to rely on each other as resources. This is the central idea of Complex Instruction.

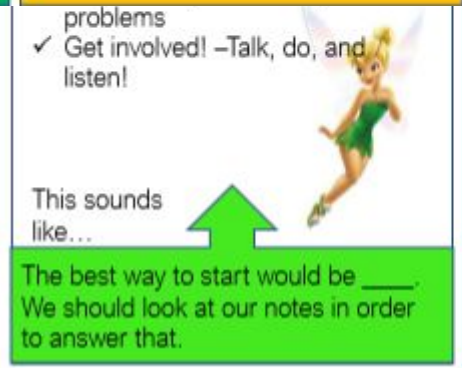
"Each individual brings valuable and different abilities to the task. All contributions are needed for success." - Cohen

Group Roles

Group roles are used to ensure each student is participating equitably. This helps with some students dominating or completing all the work and forces them to work together.

Students are given a group role when completing group tasks. The roles are presented on laminated cards that describe the responsibility of said role. Cards have sentence starters and a Disney character to remind students of their role.





Group Worthy Tasks

Group worthy tasks are challenges that students must work together on in order to be completed. The point of these tasks are for students to experience different points of view, strategies, and ways of thinking from their peers. Tasks should be challenging enough that students have to utilize group members to complete.

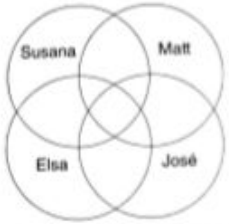
To get students familiar with group worthy tasks and group roles, try this task card from Smarter Together! Collaboration and Equity in the Elementary Math Classroom.

WHO ARE WE? TASK CARD

MATERIALS:
Pencil and paper for each member
Chart paper and markers

PART 1

1. Resource Manager needs to gather materials for the group.
2. Each member of the group should spend two minutes listing things about themselves. This time should be quiet time. (Examples might be: I have two brothers; I love to read; my favorite color is green.)
3. The Team Captain will start sharing with the group.
4. After s/he has spoken, each of the other members will comment on whether or not they share that attribute.
5. Someone will record the information for the group, putting it on a Venn diagram either in the circle for each person or in the center as a shared attribute. See the figure below.
6. Continue around the group sharing information until the teacher asks you to stop.



Venn diagram with student names

PART 2

1. When it is time to share with the class, the teacher will tell you whose information you will be sharing. You will not be sharing your own information with the group, so you need to listen carefully to what your teammates are saying and be able to explain what is written in the circle to the rest of the class.
2. Once each member of the team has been introduced, we will move on to the next group.
3. At the end, we'll look at all the intersecting circles to see what kinds of things we all have in common.

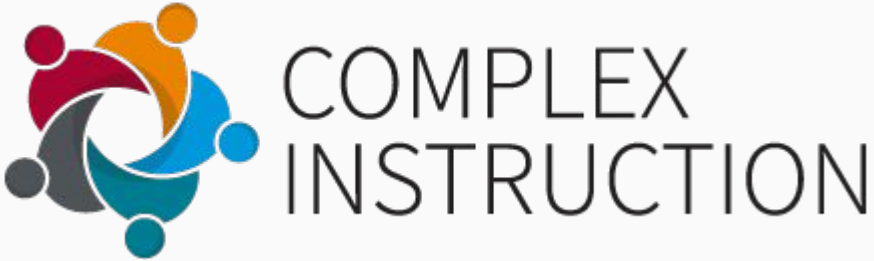
Featherstone, Helen, et al. *Smarter Together!: Collaboration and Equity in Elementary Math Classroom.* National Council of Teachers of Mathematics, 2011.

Why use Complex Instruction?

“Groupwork is an effective instructional strategy for achieving intellectual and social learning goals. It is a superior approach for conceptual learning, for creative problem solving, and for developing academic language proficiency. Socially, it can improve intergroup relations by increasing trust and friendliness. Most importantly, groupwork provides greater access to the learning tasks to more students with a wide range of academic skills and linguistic proficiency. It offers opportunities for such students to demonstrate what they have learned and for teachers to recognize their students’ intellectual growth and contributions.” - Stanford Complex Instruction

“Complex instruction works by leveling the playing field in the classroom so that a broader range of students can engage powerfully in mathematical practices.”

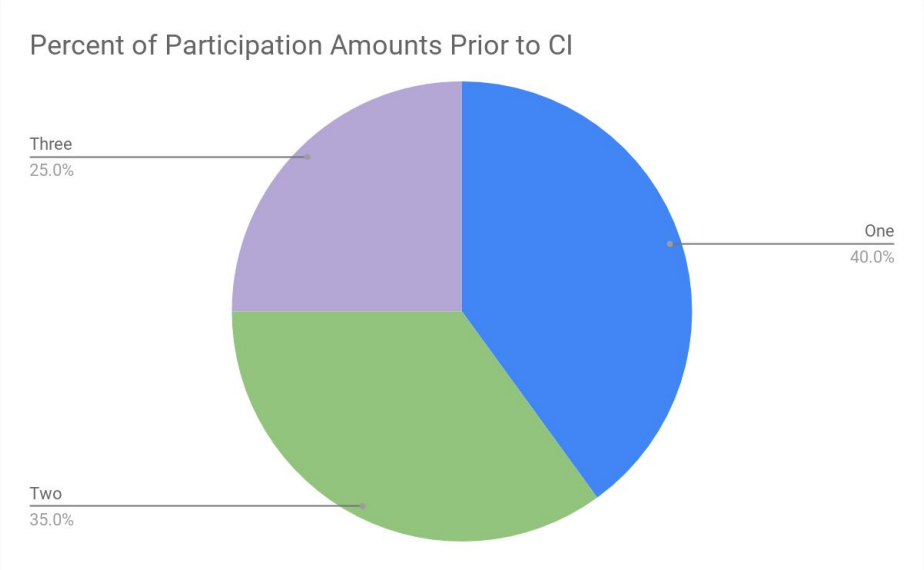
- Narrowing Participation Gaps, Victoria Hand et al.



Prior to Complex Instruction in a 3rd grade classroom

Prior to implementing Complex Instruction into the classroom, group work consisted of a few students dominating tasks and pushing low status students out from participating. It sounded like tears and arguing.

Baseline data was collected on a math task that students completed without teacher interference of refereeing or problem solving. The goal of the activity was to see the amount and type of participation. Students received a 1, 2, or 3 depending on the amount of participation. 1 being low or no participation, 2 meaning the student participated but didn't dominate the group, and 3 meaning the student controlled the group.

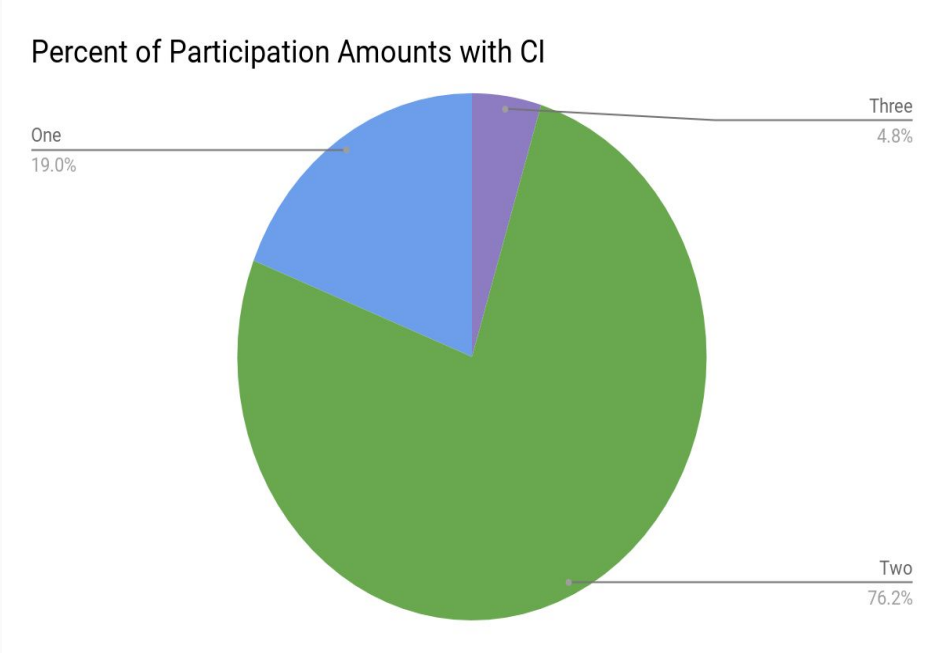


40% of students either participated little or didn't participate. 35% of students had equitable participation and 25% of students dominated the group.

Results

After introducing and using complex instruction for a few weeks, students demonstrated improved equitable participation amounts. While it will take more practice and time for students to get used to CI, more students are participating in math group worthy tasks. Students received a one rating if they did not participate enough or follow their group role card. Students received a two if they participated well but did not dominate the group. Students received a three if they controlled the group and did not follow their group role card.

19% of students participated little or not at all. 76% of students had equitable participation. 4% of students dominated the group.



Complex Instruction Resources

Stanford CI website: https://complexinstruction.stanford.edu/

Tasks for Elementary and Middle School: https://www.youcubed.org/

http://cimath.org/

Tasks for Middle and High School: https://cic.opencurriculum.org/2.0/library/11/tasks-new/stack/733/cic-task-library

References

Cohen, Elizabeth G., et al. “Complex Instruction: Equity in Cooperative Learning Classrooms.” *Theory Into Practice*, vol. 38, no. 2, 1999, pp. 80–86. *JSTOR*, www.jstor.org/stable/1477227.

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Wood, Marcy B., et al. “8 Teaching Moves Supporting Equitable Participation.” *Teaching Children Mathematics*, vol. 25, no. 4, 2019, pp. 218–223. *JSTOR*, www.jstor.org/stable/10.5951/teacchilmath.25.4.0218.