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Facilitating Student's Math Understanding through Small Group Work

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FACILITATING STUDENTS' MATH UNDERSTANDING THROUGH SMALL GROUP WORK

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Research Questions

- 1.) What activities and instructional strategies can the teacher do to promote small group collaboration?
- 2.) How do students interact with each other as a result?
- 3.) What do students think are the benefits and disadvantages of small group work as a way for them to facilitate or not facilitate their math understanding?

Methodology

- Qualitative, ethnographic research methods
- Semester-long study
- Collected and analyzed video recordings and transcripts, lesson plans, field notes, post teaching reflections, student work, and student questionnaires

Participants

- 70 geometry students from a diverse high school in Central Illinois
- Parents and cooperating teacher gave consent for study

Results

1.) How I Promoted Small Group Collaboration:

- I asked probing questions
- I managed time spent working in groups
- I planned lessons based on real world situations and different learning styles

Table of Lessons Involving Small Group Activities	
Lesson Topic & Date	Description of Small Group Activity
Classifying Quadrilaterals - 9/21/09	-Small groups -Round table worksheet: Classify quadrilaterals and their properties
Symmetry - 10/5/09	-Collaborative or individual -Create three figures out of foam plates or paper with reflectional, rotational, and point symmetries
Preparing for Proof - 10/23/09	-Work alone, then in pairs -Logically rearrange the reasons for two proofs given on overhead
Midsegments of Triangles - 10/28/09	-Small groups at five stations around room -Indirectly measure the length of a pit with tape, string, and rulers using the Triangle Midsegment Theorem
Bisectors and Locus - 11/6/09	-Small groups at five stations around room -Draw and label the set of points, or the locus, that meets the given conditions on a large sheet of paper
Points of Concurrency - 11/10/09	-Collaborative or individual -Round table worksheet: Identify points of concurrency in triangles
Special Right Triangles - 11/20/09	-Small groups at five stations around room -Real world problems: Find the height of a pole and the length of a ladder using knowledge of 30-60-90 and 45-45-90 triangles
Special Right Triangles Cont'd - 11/24/09	-Small groups -Round table worksheet: Find side lengths of special right triangles -Extra practice for all

2.) How Students Interacted With Each Other As A Result:

Scenario 1

Activity Description: Students worked in small groups on a round table worksheet on classifying quadrilaterals and their properties.

- Students depended on me for answers
- Students engaged in off-task behaviors
- Students did not receive guided instruction before starting the activity

Scenario 2

Activity Description: Students worked in small groups to indirectly measure the lengths of pits using the Triangle Midsegment Theorem.

- Students engaged in on-task and meaningful discussions with each other
- Time was effectively managed
- Students related math to the real world



Students from Scenario 2

3.) Benefits and Disadvantages of Small Group Work:

Benefits

- Students help each other to learn and understand content material
- Students share ideas and opinions with each other
- Work gets done faster and more easily
- Students become better acquainted with each other
- Students get better grades
- Communication skills are enhanced
- The activity is fun and engages students

Disadvantages

- Distracting because of off-task behaviors, and work does not get done
- Lack of participation from other group members
- Unfamiliar with content or with people in group
- The activity is too easy / does not relate to the real world
- Working alone helps some students to focus better

Conclusions

- Organized and meaningful activity and teacher's role as facilitator led to constructive student interactions
- However, small group work does not cater to all learning styles; should not be the sole instructional method in classrooms
- Study contributes to growing amount of research on how small group work supports student success in diverse classrooms