2016 RSD Community of Practice Final Report

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My project “How does the RSD increase student's abilities for critical thinking in undergraduate math courses?” will be completed in the 2016-2017 academic year. Since I will be teaching at the University of Wisconsin and at the Chippewa Valley Technical College in the 2016-2017 academic years, I will have an opportunity to compare the outcomes of RSD between these two colleges.

In the fall of 2016 at UW-Stout, I will be teaching two sections of Math 120, Introduction to College and Mathematics 1. I will incorporate the group quizzes into the first section of Math 120. I will not incorporate group quizzes into the second section of Math 120 and use this class as a comparison group.

Additionally to collecting the data at UW-Stout, I will collect it at CVTC. In the fall of 2016, I will teach Statistics and in the spring of 2017, I will teach Introduction to Statistics at CVTC. I will incorporate the group quizzes into Introduction to Statistics and use Statistics course as a comparison group.

In May of 2017, I will do a statistical analysis of the data collected between two colleges to identify similarities and differences in outcomes. Comparing the data will help me to understand how the RSD increases student’s abilities for critical thinking in math courses. Since the data will be collected between two colleges my conclusions will be based on the strong evidence of how the RSD benefits students.

- A discussion of your project’s goal.

The goal of this study is to investigate if incorporating RSD framework into group quizzes during the 16 week academic semester will advance student’s abilities to solve math problems. Students will be able to use online web resources such as Khan Academy and Purple Math during the group quiz class period to solve mathematical problems. At the end of each group quiz students will produce a video and post it in the Discussion. In a video student will comment on the process it took them to solve each problem. Using 10 minutes of the next class time each group of students will watch one of the videos posted by another group of students and comment on what the other group may need to improve on in their process.
Students will have an opportunity to learn that they can use more tools and more strategies to solve mathematical problems that they do not know how to solve initially. Therefore, it may reduce students’ anxiety about mathematics because previously unknown tools and strategies will be accessible to them and that will help them to gain confidence in finding the right answer. Also, it will teach them that team work is important for every field of study and it will help them to develop more skills that will be useful in their field. Students who completed the group quizzes and students in the comparison group will be asked to take a survey at the beginning and at the end of the semester. Along with collecting the data in reference to the survey, I will need to compare the GPA of both groups to further understand the benefit of my group quiz activity. Using this data my goal is to see if doing these group quizzes will advance my students’ skills in solving math problems.

- A discussion of your project’s assessment tools that you incorporated in an effort to determine student learning outcomes.

Qualtrics will be used for survey. The host will retain the data because comparison of the answers from the beginning and from the end of the semester will be used for the research purposes. Students will use their student id numbers for identification. I will need to match each student’s id number with responses from the beginning and from the end of the semester. Only statistical data will be shared in Scholar publications. Student names will remain anonymous for publications.

Beginning/Ending Semester Survey

Please be informed:
- This is not a test; there are no right or wrong answers.
- Your answers will be kept confidential.
- Your professor will not see your individual responses before giving you a final grade.

1. What is your student id number? ________________
2. What year are you in school? ________________
3. What is your major? ________________
4. How old are you? ________________
5. What High School did you go to? ____________________

6. What math classes did you take at High School? __________________

7. How often do you work in small groups in your math courses?
   
   0 = never; 9 = very often

8. Do you like to work in the small groups in math classes?

   0 = dislike extremely; 9 = Like extremely

9. Think about how you normally go about solving problems that you are assigned in your math classes. Indicate how often you use each of the following as a resource to help you solve these math problems. (0 = never; 9 = very often)

   a) A calculator
   b) The internet
   c) A math tutor
   d) A friend who is good in math.
   e) A fellow student in your math class
   f) A math instructor
   g) Your textbook
   h) A librarian
   i) Online math resource, Wolfram Alpha
   j) Online math resource, Kahn Academy

10. How important do you think mathematics is to your major field of study?

    0 = not at all; 9 = extremely

11. How often do you think you will need to use mathematics in your major field of study?

    0 = never; 9 = very often
12. How confident are you in your ability to solve the math problems given to you in your math classes?  
   0 = not at all; 9 = extremely

13. How often do you think you will have to use mathematics once you get a job in your field of study?  
   0 = never; 9 = very often

14. How confident are you that you will be able to carry out the math required for a job in your field of study?  
   0 = not at all; 9 = extremely

- A description of what RSD Framework-based assignments, activities and/or projects you did in your course(s). Be sure to include samples (extra attachments) of your actual assignments/projects.

In the spring of 2016, I tested my project in the College Math course at CVTC. After handing out written notes for the chapter, that includes a situation on mixture problems, students had to solve examples assigned to them on the board. Since the class had students that new each other well, they were comfortable in helping each other solve assigned problems. To finalize the project, students recorded a video where they shared two interesting problems, two real life examples, and two examples that were particularly difficult to solve.

I did this project in the College Math course for two weeks to see how this project can be modified to obtain needed data for answering the research question: “How does the RSD increase student's abilities for critical thinking in undergraduate math courses?.” Students helped me to see how my project should be modified by providing feedback on the process. The major concern for students was difficulty e-mailing me a video using the cell-phones. The videos that I was able to watch were sent to my Gmail account or showed to me after class. To accommodate students I am planning to rent needed technology at CVTC. It will be easier for students at the UW-Stout to record a video because they are provided with laptops by the school.
A summary of what was learned from assessing your students. If possible please include quantitative and qualitative results. This doesn’t have to be extensive. However, if only student comments/reflective statements are available, that’s fine too.

I observed that students were writing a script for their video. They divided speaking parts between group members before recording a video. Students recognized benefits of the group project after completing it. They commented that they could better memorize and understand information given to them during the group project than listening instructor delivering it to them. Additionally, students didn’t want to spend a lot of time recording and sending videos because they thought it takes away their time from learning. I learned from this experience that I need to prepare a step-by-step rubric for students on how to prepare a script for a video, record a video, and send it to me in the most efficient way.

Your personal insights and reflections.

In the fall of 2015 my IRB application for UW-Stout was approved. I will submit IRB application for CVTC in June of 2016. Using website, https://insider.cvtc.edu/Pages/institutional-planning-research.aspx#IRB, I will submit IRB application. I will apply for the Expedited Review because my research involves minimal risk procedures.

Your personal insights regarding what long-term lessons have been learned from being part of this experience. What would you like future cohort members to know about implementing the RSD Framework into their courses? This information will be very helpful to us as we attempt to create a checklist to pass onto other faculty.

I learned to be open to new possibilities and take chances in teaching.

Do you plan to deliberately tell the students about the RSD Framework or is it simply a reference that is guiding how you think about your research?

I will talk with students about RSD Framework because it will help them understand significance of the project. Students will need to know about RSD Framework in the beginning of the semester before taking the first survey.