

Transitioning to a Hybrid Model: Mathematics Content Courses for K-8 Preservice Teachers

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Abstract

In Summer 2020 we had to modify the format of our courses, due to the COVID-19 Pandemic. In this presentation, we will share how our face-to-face classes are normally taught, how they were adapted to become more conducive to online learning, and student comments from reflections at the end of the summer semester.

Background of Courses

Content courses at Georgia Southern University

- 5 weeks for each course (but normally a 15-week course)
- Summer classes meet 5 days each week for 1 hour 40 minutes each session so appx 40 hours (post-COVID they met twice each week on zoom for one hour each time so appx 10 hours which meant the majority of content was learned outside meeting times)
- Elementary, SPED, and middle grades preservice teachers (PSTs)
- Student-centered classroom
- Pre-COVID each summer course focused on:
 - Working in groups
 - Solving problems in multiple ways
 - Moving from concrete to representational to abstract (CRA process) and making connections between them
 - Identifying student errors
 - Explaining and justifying strategies
 - Fostering a growth mindset
 - Shifting beliefs about teaching / learning mathematics
- Post-COVID challenges:
 - Not face-to-face so cannot work in groups the same way as in-person classes
 - Student engagement both in class and out of class
 - Cannot use physical manipulatives (Concrete part of the CRA process, but tried to use virtual tools)
 - Students cannot attend physical class
 - Professor never taught a course online before
 - Difficult to find videos that demonstrated best practices

Summer 2020 Content Courses

- Math 2008: Foundations of Number and Operations ($n=14$)
 - First content course in a series of 3 courses
 - Focus on number and operations
 - Summer A Term (May - June)
- Math 3032: Foundations of Data and Geometry ($n=20$)
 - Second content course in a series of 3 courses
 - Focus on geometry, probability, and statistics
 - Summer B Term (June-July)

Question Data 1:

What did you like most in this math course, and why?

Theme	2008 Frequency	3032 Frequency
Zoom Session	7	8
Assignments	2	6
Course Set-Up/Organization	2	1
Modeling best practices	6	7
Critical Area Project	0	7

** Some students wrote about more than one theme in their reflection

- **Zoom Session:**
 - PSTs attended bi-weekly zoom meetings in place of face-to-face classes each week. This theme was the most common in both courses.
 - PSTs commented that the zoom meetings gave them a feel of being in a face-to-face setting.
 - *"I actually liked the zoom sessions because it made me feel like I was in the classroom."*
- **Assignments:**
 - The assignments in this course included paper homework, discussions, reflections, reviews, and pre-zoom assignments.
 - *"They forced me to use my mind and explore different strategies."*
- **Course Set-Up/Organization:**
 - These courses were set up into modules for each unit containing videos related to that unit's content.
 - PSTs commented that breaking up the course into these modules helped them stay organized and that seeing the content explained in videos was beneficial.
 - *"All of the information was in one place and was easy to find. I also really liked the videos with the actual students doing the process."*
- **Modeling Best Teaching Practices:**
 - Aside from learning the course content, PSTs also learned strategies for implementing the content in a classroom, and got to see research-based best teaching practices modeled by the course professor.
 - *"I enjoyed how excited she was if we were to get [an answer] wrong, because of the lightbulb moment we had when we reworked the problem to get the correct answer. It never felt like the end of the world if we got something wrong"*
 - *"I liked talking about how to approach teaching some of these concepts and the use of manipulatives."*
- **Critical Area Project:**
 - The final project in these courses is to choose a critical area, find an associated mathematics content standard, and create a 4-6 minute video they could show to students, teaching the content in an engaging way.
 - *"I liked the CAP project I felt like it was a future look at our careers and it was super fun."*
 - *"I actually found the CAP extremely helpful to learn better ways to teach effectively"*

Question Data 2:

What did you like least in this math course, and why?

Theme	2008 Frequency	3032 Frequency
Organization/Course set up	1	1
MLM assignments/notes	8	7
Workload	5	9
Course content other than MLM (Paper homework, Discussions, module videos)	1	5

**Some student responses were categorized as more than one theme

- **Organization:**
 - PSTs talked about the course being online and the organization and set-up of the modules.
 - *"I did not like the fact it was online and went by fast."*
- **MLM Assignments/Notes:**
 - PSTs talked about the number of MyLabMath (online) homework assignments, how repetitive the notes/reviews were, and how many questions were in each assignment.
 - *"I think I disliked the MLM homework. There were a ton of questions for each segment. However, it was very useful and informative, so I can't complain about something that [was] actually helping me learn."*
 - *"I think that the my math labs should be more spread out or at least all open in the beginning."*
- **Workload:**
 - PSTs talked about how the course had too many different assignments and that it was fast-paced.
 - *"What I liked least was just how fast paced it was, you had to really stay on top of the work, so that you didn't get behind."*
 - *"Honestly just how crammed it was but that's what you get when you sign up for summer. I think fall or spring would be much more relaxed."*
- **Course Content:**
 - PSTs talked about their experiences with the course assignments including paper homework assignments, discussion posts, module videos, etc., not including online MLM assignments.
 - *"The thing that I liked the least about this course was the paper homework. I think the paper homework helped me a lot in understanding the content and being able to work through problems, especially after I got feedback from the professor but I don't feel like these assignments should've been worth so much."*
 - *"I didn't like having to do the review. Between MLM, notes, and the book readings I feel the review was just me rewriting everything."*

Discussion

Commonalities between courses

- What they liked:
 - Attending Zoom sessions and modeling best practices were the most common comments in both courses. This may be due to the focus on engagement and best practices in both courses.
 - In 3032 (the second course in the sequence) students also commonly mentioned enjoying the Critical Area Project (CAP). While students in 2008 also completed the CAP, no students mentioned this as their favorite part of the course. Because 3032 is the second course in the sequence, by the time they complete the 3032 CAP, they may have realized the importance of applying what they're learning and completing hands-on projects.
 - In 3032, 3 of the 7 specifically mentioned something about the teacher's availability. The instructor tried to hold various office hours by using a google form to determine student availability (classes were very small this summer so it was more manageable than in a normal semester, but the instructor wanted to be more accessible since the format of the class was new to many students)
- What they didn't like:
 - MLM assignments and notes and workload were most commonly disliked in both courses.
 - Workload; this is typical, even in previous summer semesters when we were face-to-face, because it is a condensed course.

Implications

- Students liked interacting with the instructor and each other (first time many had done this since we moved online in March)
- Used chat feature so they could respond to questions but also encouraged them to unmute and respond when only a few students attended
- Students appreciated the instructor modeling best practices while PSTs engaged in the content (focus of the course was content, but delivered through student-centered instruction)

Changes to future classes

- Pre-assignment, notes, weekly quizzes, and attendance are part of "engagement"
- Chat feature on zoom so students only respond to the instructor (other classmates cannot see how they respond)
- Students work in zoom groups during class to get more interaction with each other (and multiple jamboard slides so each group can work on and look at the same screen and I can pop between groups)

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