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Peer Review of Teaching Benchmark Portfolio – SPED 414: Instructional Methods for Teaching Mathematics to Students with Mathematics Learning Disabilities

Jessica Namkung

University of Nebraska-Lincoln, nmin2@unl.edu

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Peer Review of Teaching Benchmark Portfolio – SPED 414: Instructional Methods for
Teaching Mathematics to Students with Mathematics Learning Disabilities

Jessica Namkung

Department of Special Education and Communication Disorders,

University of Nebraska-Lincoln

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Abstract

The primary purposes of the benchmark portfolio were to systematically document revisions made to the course, SPED 414: Instructional Methods for Teaching Mathematics to Students with Mathematics Learning Disabilities (SPED 414), to refine and explore more effective ways to teaching the course, and to build better connections and in-depth, higher level in-class activities and discussions. Specifically, I focused on reorganizing the course content, incorporating more hands-on activities (e.g., small and large group discussions, real-life examples), implementing “*Keep, Stop, Start*” mid-evaluation, and conducting a pre- and post-assessment on the main course objectives. Both qualitative and quantitative analyses based on course evaluations, student improvement on the lesson plan assignment prior to and after the peer review and revision process, and student improvement on the pre- and post-assessment indicated that the changes I have made were effective and well-received by the students.

Table of Contents

Objectives4
 Course Description4
 Reasons for Choosing SPED 4146
 Teaching Methods and Course Activities8
 Organization and Content8
 Teaching Methods9
 Mid-Evaluations10
 Lesson Plan Assignment11
 Pre- Post-Assessment12
 Analysis of Student Learning13
 Course Evaluations13
 Lesson Plan Assignment15
 Pre- Post-Assessment16
 Reflections18
 Appendix A. Course Syllabi – Pre and Post Revisions19

Peer Review of Teaching Benchmark Portfolio – SPED 414: Instructional Methods
for Teaching Mathematics to Students with Mathematics Learning Disabilities

Objectives

The purpose of this benchmark portfolio was to revise, assess, and document my teaching for SPED 414: Instructional Methods for Teaching Mathematics to Students with Mathematics Learning Disabilities (SPED 414) and my students' learning. I specifically chose to refine this course because it was a new course I developed after joining the University of Nebraska-Lincoln. Since teaching this course in 2017, I have gone through several revisions based on student feedback, but I wanted to explore more effective and balanced ways of teaching the contents of this course that maximize student learning and engagement. Through the benchmark portfolio, I would like to systematically document revisions I made to this course, refine and explore more effective ways to teaching the course, and build better connections and in-depth, higher level in-class activities and discussions.

Description of the Course

SPED 414 is a mathematics methods course that provides preservice teachers with knowledge and skills for teaching mathematics to students with mathematics learning difficulties. This course focuses on building the foundational knowledge of understanding potential causes of mathematic learning difficulties, academic and cognitive characteristics of students with mathematics learning difficulties, and evidence-based practices in addressing the needs of students with mathematics learning difficulties (e.g., explicit instruction, precise mathematics language, peer assisted learning strategies, data-based decision making).

There are typically three different groups of students who take this course: (1) early childhood/inclusive majors who focus on teaching children from birth to third grade, (b)

elementary dual majors in both general and special education who focus on teaching students from kindergarten to sixth grade, and (c) secondary special education majors who focus on teaching students from sixth to twelfth grade. This course is required for all three majors who will be obtaining teacher licensure in their major areas. The course typically consists of 25 to 35 students, with the majority being elementary dual majors and about five students in each early childhood and secondary special education majors. Enrolled students are typically juniors or seniors. About one fourth of students (mostly secondary special education majors and some elementary dual majors) will become teachers of students with disabilities and specifically work with students with disabilities, and three fourth of students (early childhood and majority of elementary dual majors) will become general education teachers who support students with various disabilities in their classrooms.

During the Spring 2019 semester, 19 students were enrolled. Of the 19 students, four students were early childhood inclusive majors, and 15 were elementary dual majors. No secondary students were enrolled. Of the 19 students, 16 were females and three were males. All students, except for two, were Caucasians. The students enrolled in the Spring 2019 semester were different from the typical students in the past in several ways. First, there was a significantly smaller number of students, and this was the first time that no secondary students were enrolled in the course. Second, there was more diversity in terms of gender and ethnicity compared to the typical students enrolled previously. The past SPED 414 courses had been mostly female Caucasian students.

As discussed, the primary goals of the course are to build the foundational knowledge in understanding cognitive and academic profiles students with mathematics learning difficulties

and to learn and be able to apply evidence-based practices to teaching students with mathematics learning difficulties.

The specific learning objectives are:

1. Understand potential causes of mathematics learning difficulties
2. Understand cognitive processes underlying mathematics and how those processes may be related mathematical difficulties
3. Understand mathematical profiles (e.g., common areas of difficulties, characteristics of difficulties) of students with mathematics learning difficulties
4. Understand evidence-based practices and be able to apply them to specific mathematical content students are teaching

Reasons for Choosing SPED 414

I chose SPED 414 as my benchmark portfolio course based on several challenges I have encountered and tried to problem solve. The major issue is that there is great diversity, not only in terms of students' background but also in their focus of contents. As previously described, three different groups of preservice teachers take this course as a program requirement: (1) early childhood majors with a focus on children from birth to third grades, (b) elementary dual (elementary and special education) majors with a focus on kindergarten through sixth grades, and (c) secondary special education majors with a focus on sixth through twelfth grades. Therefore, the course content covers a continuum of mathematics methods for teaching very young children to high school students.

The preservice teachers also come in with various background in terms of prior knowledge and experience in mathematics. The elementary dual majors have taken their general education mathematics courses (both methods and content) and have already had practicum

experience in teaching mathematics. On the other hand, the secondary special education majors come in without having taken any courses in mathematics content or methods. Typically, the early childhood majors take another mathematics methods course for typically developing children concurrent to taking SPED 414. Therefore, I have struggled to find a fine balance in terms of how much mathematics content should be taught or reviewed, so that my elementary dual majors do not think of the course as a repeat of what they have already taken, but that my other majors are provided with enough prerequisite mathematics content knowledge to apply the methods they learn.

Another challenge I often encounter is the lack of motivation due to their negative attitudes or experiences in mathematics. Many students come into the course with general fear for teaching and learning mathematics. Most students have a preconceived notion that they are “not good at math” and have not had positive experiences learning or teaching mathematics. Many are not afraid to share that they “hate math”. Improving students’ negative attitudes towards learning and teaching mathematics is important as teachers’ attitudes are often correlated with their students’ achievement, so that they can also positively affect their students in their future jobs.

Teaching Methods and Course Activities

Main Revisions to the Course

I have been refining SPED 414 by changing the textbook, reorganizing the content of the course entirely, incorporating different teaching methods, revising the assignments, and implementing weekly quizzes on weekly assigned articles. Some of these have been carried over from the previous semesters as continued efforts to improve my teaching and students' learning, and some are new revisions I incorporated specifically for SPED 414 in the Spring 2019 semester. I have detailed the revisions and provided examples below.

Organization and Content. Since the first iteration of the course, in which many dual majors indicated that the course overlapped too much with their previous mathematics courses, I met with other professors who teach mathematics content and methods courses in the Department of Child, Youth and Family Studies, Department of Teaching, Learning and Teaching Education department, and Department of Mathematics to compare course content and structures. Appendix A shows the previous and revised course syllabus. As shown in the revised course syllabus, I have re-designed the course to reduce the overlap in the content knowledge. In doing so, I have also changed the course textbook and course readings.

The course is now focused on the evidence-based practices in mathematics with mathematics content built in with each strategy. I focused on finding a balance between how much mathematics content is covered because teaching mathematics content is still important for students who have not had previous courses in mathematics, but also for the majority of dual major students who often have incorrect knowledge or need reviews. Therefore, in the revised course, I tried to tie a specific mathematics content with an evidence-based practice, specifically using the concrete, representations, and abstract models. This way, students are more focused on

implementing the evidence-based strategy, but also are provided with a review of the content. I also built layers of differentiations that students who are more fluent and confident could work on more challenging mathematical concepts and would be the leaders in facilitating in other students' learning during group work. For example, when reviewing a more difficult mathematical concept, I purposefully grouped students, so that each group would have a dual major who at least would have had previous course work and teaching experience with the particular concept.

Teaching Methods. In revising the course, I embedded various in-class activities, including small-group discussions, case studies, student-led demonstrations, large-group discussions, in addition to the traditional lectures. For example, during the second week of class, I had students in four different groups and had them create a developmental map of mathematics for infants to elementary school aged students. We compared how much we knew about the development of reading, in which most students confidently and correctly identified important milestones even at infancy. Students realized that they had little understanding of how mathematics develops in infants and toddlers, and that mathematical concepts also develop early on as with reading. In previous courses, I had delivered the same content as part of traditional lectures, but I noticed that students were more engaged and had a more direct impact on their learning by incorporating a more hands-on activity.

Another revision I focused was large-group discussions. Since I had a smaller number of students than the usual, it was a great opportunity to try a new teaching method. Although I had tried to embed whole class discussions, it was often difficult to engage students when the group size was big. This semester, I purposefully planed discussion questions that were relevant across the majors prior to each class session. I had students form a large circle and first had them think,

pair, and share before discussing as a whole class to ensure that students who were not comfortable sharing with everyone still had a chance to discuss with their partners. As weeks progressed, students in general were excited by the large discussions. When I would ask students to form a circle, I often heard positive comments like, “Yes!” “*I love big group discussions*”, which were encouraging.

I also incorporated more videos to provide real-life examples of the key contents and to keep my students engaged. For example, I shared a video of my son counting when he was two versus when he was three as real-life examples. I also used the videos to further discuss whether what they saw in the video were typical or atypical development, and to identify foundational counting skills that were achieved versus not achieved yet (e.g., one-to-one correspondence, cardinality), and to discuss what had changed in the two years. I further challenged students to think about the cognitive development that contributed to the differences they saw in the counting abilities.

Mid-evaluations. I also implemented “*Keep, Stop, Start*” mid-semester evaluations for the first time. This was shared during the Peer Review of Teaching meetings. I asked the following questions for each element: “What is contributing to your learning/goals in this class that you would like me to continue?” for *Keep*; “What is distracting from your learning/goals or is not working well for you?” for *Stop*; “What would you like see me do to facilitate your learning/goals in this class?” for *Start*. I had asked for mid-evaluations in previous semesters, but I think the “*Keep, Stop, Start*” questions were more effective and simple ways to assess and revise my teaching. Besides addressing students’ comments in planning the subsequent classes and discussing how I was going to improve students’ learning, I also discussed things that I

would not change despite my students' feedback (e.g., allowing laptops during class time) and provided with reasons for why, rather than ignoring the comments.

Lesson plan assignment. Creating a lesson plan is a required assignment that is used for program evaluations in the department. The lesson plan assignment is a culminating project that can evaluate all of the four learning objectives. In order to write a good lesson plan, students must understand the underlying causes of the difficulties, common difficulties students with mathematics learning difficulties share, and how to incorporate the evidence-practices that are appropriate for remediating the specific difficulties. In previous semesters, I provided detailed directions, a template, and an example lesson plan for their lesson plan assignment. However, I wanted to explore ways to improve their lesson plan as this assignment has the most point values (i.e., 17.2% of the final grade). One way to improve students' learning is by incorporating peer feedback. Peer feedback can be a useful tool to engage students in thinking carefully about the goals of the lesson plan assignment and evaluation criteria and to provide an opportunity to learn from one another.

Prior to the peer feedback, I shared an example lesson plan and had my students score the lesson plan according to my rubric. I then had the students compare their scores with a partner and discuss ways to improve the lesson. Then, I revealed my scoring and provided detailed feedback on how to improve the example lesson. This process ensured that students clearly understood the goals and criteria of the lesson plan assignment before scoring and providing feedback on their peers' lesson plan.

Pre and post assessment. This semester, I also conducted pre and post assessment to evaluate students' progress and their learning in regard to the primary course objectives. Students provided a written answer to four specific questions related to the main course objectives: (1)

What are the causes of mathematics learning difficulties? (2) What is explicit instruction? (3) What is an evidence-based practice? and (4) What are the instructional strategies for teaching students with mathematics learning difficulties? For each question, students earned up to 3 points based on the quality of explanations they provided. Across four questions, providing no answers (i.e., “*I don’t know*” “*I am not sure.*”) or incorrect answers that were not relevant to the question were scored as 0. I administered the pretest on the first day of class and re-administered the same measure as the posttest on the last day of class.

Analysis of Student Learning

Student learning was evaluated in several ways. First, I analyzed student feedback on the mid-semester (*Keep, Stop, Start*) and end-semester evaluations descriptively to evaluate the content and teaching methods I incorporated. For the lesson plan assignment, which is the most important and culminating output that evaluates multiple learning objectives, I examined the correlation between the initial lesson plan without peer feedback and the final lesson plan after the peer feedback and revisions. I also conducted a statistical analysis to examine whether students made significant improvement in their lesson plan scores after the peer feedback and revision process. Finally, I conducted a statistical analysis on the data from the pre and post assessment to examine whether students made significant improvement on the learning objectives over the semester.

Course Evaluations

The evaluation of the revisions I have made to the course content and organization, and teaching methods were reflected in the student feedback I received in the mid- and end-semester evaluations I conducted in class in addition to the official online course evaluation. At the mid-semester, for “*Keep*”, overall, 62.3% of students (12 of 19 students enrolled in the course) specifically indicated that they were enjoying the small and large group discussions. Some examples comments were:

“I like the atmosphere of large group discussions.”

“I like when we are in a circle having whole class discussions. Makes the content more meaningful.”

“Small group work – better get to know classmates.”

Additional two students specifically commented that they *“like the videos and examples shared with the class”*. Three students commented that the *“structure of the quizzes were helpful”* and working well.

For *“Stop”*, 73.7% (14 of 19 students enrolled in the course) responded that there was nothing that was distracting them from learning or is not working well. Two students indicated that s/he did not like group discussions. One student indicated that s/he would like to see *“less focus on the very young children and more about upper elementary students”*. For *“Start”*, five students indicated that they did not have anything else that would further facilitate their learning. Another five students’ responses were regarding the weekly quizzes. The feedback varied from allowing students to answer two questions and taking a higher score, taking quizzes at the end of class, going over quiz questions, and providing quiz guidelines. One student specifically asked if I could allow a laptop to take notes.

After the mid-evaluation, I shared some comments with the class and also discussed what I was going to keep, stop, and start based on the feedback. For example, I explained why I was not allowing a laptop. That particular student further commented on the official online course evaluation that *“Personally, I like to take notes on my laptop, but I can understand how she feels they can be a distraction.”* This made me realize that it is important to discuss the feedback on things that I was not going to change, so that students clearly understand the reasons. I also incorporated more upper elementary examples and provided more feedback on the quizzes after grading.

In addition, on the official course evaluation, several students provided positive comments on the class content and in-class activities. Some examples included:

“I really enjoyed our class discussions. Our professor usually asked questions that really made us think and engage in important dialogue!”

“I liked the class discussion that was present in this course. They were meaningful and engaging.”

“I appreciated that my professor provided videos and activities for us to complete that went along with our topic. She was always willing to answer questions and guide me through any confusing concepts such as how to use manipulatives to teach kids with MLDs.”

Based on the overall positive feedback, it appears that the revisions I was making were effective and well received by the students.

Analysis of Incorporating Peer Review: Lesson Plan Assignment

In order to evaluate whether incorporating peer review was effective in improving students' learning, I first examined the correlation between two scores: the initial lesson plan score without peer feedback and the final lesson plan score after the peer feedback and revisions. I expected that students make significant revisions and improve their initial scores after receiving peer feedback that their initial and final scores would be minimally correlated. Although the correlation between the scores on the initial and final lesson plan was not statistically significant, it was moderately correlated, $r = .33$. It was interesting to me that the correlation between the initial and final lesson plans was higher than I expected. That is, students who had strong lesson plan initially tended to have higher scores. I had hoped that most students would be able to improve their lesson plans significantly and earn higher scores regardless of their initial scores.

Overall, students scored 45.18 on average (90.36%; Max score = 50). I also examined the correlation between the lesson plan score and the final grade. As expected, there was a

significantly high correlation, $r = .62$. In addition, I conducted a paired-samples t-test to compare the initial and final scores of the lesson plan. Results indicated that there was a statistically significant difference in the scores of the initial lesson plan ($M = 41.91$, $SD = 45.18$) and final lesson plan after the peer review and revisions ($M = 45.18$, $SD = 3.23$), $t = -2.66$, $df = 18$, $p = .016$. The mean difference was 3.28 that the final lesson plan scores were approximately 3.28 points higher than the initial lesson plan scores. This provided evidence that incorporating peer review was effective and did significantly improve student lesson plan outcomes.

Analysis of Pre and Post Assessment

Table 1 provides the means and standard deviations of the total pre and post-test scores as well as the scores of the individual items, and the results of the paired sample t-test. At pretest, students had minimal knowledge about the four questions asked. Approximately 52.6% of the students responded that they were not sure, or they didn't know the answer to the first question. Some examples of incorrect or partially correct responses to the potential causes of mathematics learning disabilities included: "*maybe a wiring malfunction in the brain*", "*no practice outside of school*", and "*no motivation to learn*". For the second question on defining explicit instruction, approximately 42.1% of the students indicated that they didn't know the answer.

More students provided responses to the question three and four with only two students (10.5%) indicating that they didn't know the answer. However, students also had minimal understanding of instructional strategies they will use for students struggling with mathematics. Almost all students answered the question with accommodations they can provide, such as modifying the assignment, providing more time, and providing one-to-one instruction, rather than specific mathematical strategies (e.g., building fluency, providing concrete, representational, and abstract models, and using/teaching precise mathematics vocabulary) that

are evidence-based. Overall, students had a better understanding of what evidence-based practices were compared to other questions.

The same four questions were asked on the last day of class. One student was absent on the last day and was therefore excluded in the posttest and subsequent paired samples t-test analysis. As shown on Table 1., their scores on the posttest improved significantly even after correcting the alpha level for multiple t-tests. Particularly on the fourth question, almost all students provided at least three evidence-based practices they will use for students struggling with mathematics.

Table 1. Pre and Post Assessment

	Pre ($N = 19$)	Post ($N = 18$)	Average Improvement	Paired t-test Statistics
	$M (SD)$	$M (SD)$	$M (SD)$	T
Item 1	.47 (.61)	2.56 (.78)	2.06 (.94)	-9.30**
Item 2	.21 (.42)	2.27 (1.13)	2.06 (1.06)	-8.26**
Item 3	1.37 (1.50)	2.33 (1.19)	1.06 (.35)	-3.04*
Item 4	.79 (.63)	2.94 (.24)	2.17 (.62)	-14.87**
Total	2.84 (1.61)	10.11 (1.91)	7.33 (1.88)	-16.56**

Note. * $p < .01$; ** $p < .001$

Reflections

Overall, the revisions I have made to SPED 414 in the Spring 19 semester were effective in several ways. First, the results of mid-semester feedback and official online course evaluations reflected mostly positive comments on the changes in course organization, and various in-class activities (e.g., videos, hands-on activities) and teaching methods (e.g., small and large group discussions) I incorporated. Second, the qualitative analysis on the lesson plan assignment indicated that students made significant improvement after the peer feedback and revision process, which I had not implemented in previous semesters. Third, the quantitative analysis on the pre- and post-assessment of students' understanding in the primary course objectives indicated that students made significant gains at the end of the semester.

I plan to continue to improve the course through the iterative process of evaluation and reflection. I will continue to develop and incorporate more hands-on activities that can deliver the same content knowledge in a more engaging way. I also plan to break down the lesson plan assignment further and incorporate peer feedback with each section of the lesson plan. I will continue to take qualitative and quantitative data, including pre- and post-assessment and mid-semester feedback, to improve my teaching. I think that I have not evaluated but should incorporate in my future courses is assessing students anxiety and attitudes in teaching and learning mathematics prior to and after taking the course.

My overarching goals are to prepare students in preservice training with both pedagogical knowledge and content knowledge for teaching students with disabilities. I hope that my continuous efforts to improve my teaching and my students' learning will effectively facilitate achieving these goals.

Appendix 1: Course Syllabi – Pre and Post Revisions



SPED 414: Instructional Methods for Students with Mathematics Learning Disabilities

Instructor: Dr. Jessica Namkung
Office location: 359 Barkley Center
Office hours: By appointment
E-mail: jessica.m.namkung@gmail.com / nmin2@unl.edu
Phone: 742-3948
Class location: Rm.130
Class time: Tue., 1:00-3:50
Prerequisites: SPED 201, Sophomore standing

Course description

This methodological course provides students with knowledge and skills for teaching mathematics to those with mathematics learning disabilities (or difficulties). The course consists of three components. The first focuses on the potential causes and characteristics of mathematics learning disabilities. The second emphasizes various evidence-based instructional procedures (e.g., explicit instruction, peer assisted learning strategies, manipulatives) and their applications in critical domains (e.g., early numeracy, fractions). Lastly, the course provides introduction to formal and informal assessments in mathematics, and applying data-based decision-making to guide instruction.

Course Competencies

Following the completion this course students will be able to:

- Understand critical math contents (e.g., early numeracy, fractions, algebra).
- Describe primary areas of difficulty for students with mathematics learning disabilities.
- Understand national and state standards that guide mathematics curricula, instruction, and assessment.
- Understand and implement a range of instructional methods used to teach mathematics.

Required Textbook

Hudson, P., & Miller, S.P. (2006). *Designing and implementing mathematics instruction for students with diverse learning needs*. Boston: Allyn & Bacon.

Additional Readings

Weekly article readings are arranged on Blackboard in folders. Each folder is identified as a particular class and topic exactly as stated on the Course Schedule of Events. You will need to read each article for a class **prior to attending that class**.

- Baroody, A. J., Bajwa, N. P., & Eiland, M. (2009). Why can't Johnny remember the basic facts?. *Developmental Disabilities Research Reviews, 15*, 69-79.
- Fuchs, L. S., Fuchs, D., Powell, S. R., Seethaler, P. M., Cirino, P. T., & Fletcher, J. M. (2008). Intensive intervention for students with mathematics disabilities: Seven principles of effective practice. *Learning Disability Quarterly, 31*, 79-92.
- Geary, D.C. (2004). Mathematics and learning disabilities. *Journal of Learning Disabilities, 37*, 4-15.
- Jitendra, A. (2002). Teaching students math problem-solving through graphic representations. *Teaching exceptional children, 34*, 34-38.
- McGuire, P., Kinzie, M. B., & Berch, D. B. (2012). Developing number sense in pre-k with five-frames. *Early Childhood Education Journal, 40*, 213-222.
- Ok, M. W., Kim, M. K., Kang, E. Y., & Bryant, B. R. (2015). How to find good apps: An evaluation rubric for instructional apps for teaching students with learning disabilities. *Intervention in School and Clinic, 51*, 244-252.
- McNamara, J. and Shaughnessy, M.M. (2011). *Student errors: What can they tell us about what students Do understand?* Sausalito, CA: Math Solutions.
- Powell, S. R., & Stecker, P. M. (2014). Using data-based individualization to intensify mathematics intervention for students with disabilities. *Teaching Exceptional Children, 46*, 31-37.
- Russell, S. J. (2000). Developing computational fluency with whole numbers in the elementary grades. *New England Math Journal, 32*, 40-54.

Course Policies

Attendance Policy

Points for in-class group activities and participation, which will be distributed randomly throughout the semester, cannot be made up if you are absent.

Students are expected to attend all classes (arrive on time and stay for the entire class period). No make-up examinations are allowed unless you were sick and can present a doctors' excuse, or you have obtained permission from the instructor at least one week prior to the examination day.

Missing class will impact your grade:

- 3 absences will result in lowering the final grade by one grade letter.
- 4 absences will result in lowering the final grade by two grade letters.
- 5 absences will result in an F for the course.
- 3 tardies (arriving late or leaving early without permission) will result in one absence.

Late Assignments

Assignments are to be submitted on the due dates specified on the syllabus. One point will be deducted for each day an assignment is turned in late. Assignments will not be accepted after one

week from the scheduled due date. At that time, students will receive a score of 0 on the assignment. The only exception is if a student makes arrangements with the instructor at least two weeks prior to the assignment due dates. Assignments may not be redone after they are submitted in order to obtain a higher score.

Computers, Cellphones, Sleeping in Class

No laptops are permitted in the classroom at anytime—even at break. The only exception is if a student is receiving services through *Services for Students with Disabilities* contacts the instructor.

Cellphones may not be taken out at anytime in the classroom—even at break. However, students are free to use their cellphones outside of the classroom at the break. All cell phones must be silenced before entering the classroom.

It is normal for some students to feel sleepy during class given the demands of work and school during any given day. It is the student’s responsibility to monitor his/her state of sleepiness. Students who find themselves getting tired should excuse themselves from the classroom, take a few minutes to refresh, and then return.

Assignments and Grading

Assignment	Points
In-Class Activities and Participation	10
Technology Evaluation	10
Task Analysis: Scope and Sequence Tracing	10
Basic Facts	20
Lesson Plan	20
Error Analysis	10
Children’s Literature Review	10
Hands-on Final	25
Quiz	60 (15 pts x 4)
Total	175

Detailed handouts for each assignment will be provided.

Point Percentage	Letter grade	GPA
97% - 100%	A+	4.0
93% - 96%	A	4.0
90% - 92%	A-	3.67
87% - 89%	B+	3.33
83% - 86%	B	3.0
80% - 82%	B-	2.67
77% - 79%	C+	2.33
73% - 76%	C	2.00
70% - 72%	C-	1.67
67% - 69%	D+	1.33
63% - 66%	D	1.00
60% - 62%	D-	.67

Academic Ethics/Honesty

Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University supports a Student Code of Conduct, which addresses the issue of academic dishonesty.

All students will follow the UNL Graduate Studies guidelines related to academic honesty, plagiarism, and related issues. Students are expected to contribute their own original work on all assignments and appropriately acknowledge references and resources. Failure to maintain academic ethics/honesty including avoidance or cheating, plagiarism, collusion, and falsification will result in a grade of "F" in the course, and may result in charges being issued, hearings held, and/or sanctions being imposed.

Diversity Statement/Accommodation

The University of Nebraska-Lincoln is committed to a pluralistic campus community through Affirmative Action and Equal Opportunity. We assure reasonable accommodation under the American with Disabilities Act.

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

WARNING!

Students in the College of Education and Human Sciences are required to obtain a minimum grade of C+ or higher (depending on the major) in SPED 414 in order to either move into certain majors, student teach, and/or graduate. Therefore, it is imperative that students monitor their scores on Bb and adjust their study habits/performance accordingly. All grades are final and based solely on the point total ranges indicated in the syllabus. There are no exceptions and no options for extra credit or to redo assignments.

Class Schedule

Date	Topics	Readings	Assignment due
1/10	<ul style="list-style-type: none"> Introduction 		
1/17	<ul style="list-style-type: none"> NE Math Standards Mathematics Learning Disabilities and Difficulties Response to Intervention 	Geary (2004)	
1/24	<ul style="list-style-type: none"> Domains of Mathematics Effective Instruction 	Fuchs et al., (2008) Ok et al., (2015)	
1/31	<ul style="list-style-type: none"> Early Numeracy Lesson Plans 	McGuire, Kinzie, & Berch (2012) Hudson & Miller (2006); 165-187	Technology Evaluation
2/7	<ul style="list-style-type: none"> Basic Facts Quiz 1 	Baroody, Bajwa, & Eiland (2009) Hudson & Miller (2006); 200-214 & 244-261	
2/14	<ul style="list-style-type: none"> Place Value Task Analysis: Scope and Sequence Tracing 	Hudson & Miller (2006); 188-199	Basic Facts Instruction
2/21	<ul style="list-style-type: none"> Whole-Number Computation 	Russell (2002) Hudson & Miller (2006); 215-243; 262-283; 317-339	Lesson Plan Group 1
2/28	<ul style="list-style-type: none"> Fractions, Decimals, Percents Quiz 2 	Hudson & Miller (2006); 284-316	Task Analysis
3/7	<ul style="list-style-type: none"> Mathematics Assessment (Progress Monitoring using CBM) 	Powell & Stecker (2014)	Lesson Plan Group 2
3/14	<ul style="list-style-type: none"> Word Problem Solving Quiz 3 	Jitendra (2002) Hudson & Miller (2006); chapter 6	
3/21	Spring Break: No Class		
3/28	<ul style="list-style-type: none"> Error Analysis 	McNamara & Shaughnessy (2011)	Children's Math Literature Review
4/4	<ul style="list-style-type: none"> Pre-algebra 	Hudson & Miller (2006);432-464	Error Analysis
4/11	<ul style="list-style-type: none"> Algebra Quiz 4 	Hudson & Miller (2006);465-488	
4/28	<ul style="list-style-type: none"> Review for Hands-On Final 		Lesson Plan Group 3
4/25	<ul style="list-style-type: none"> Individual Hands-On Final Will Be Scheduled 		

**SPED 414/814: Instructional Methods for Students with Mathematics Learning Disabilities**

Instructor: Dr. Jessica Namkung
Office location: 359 Barkley Center
Office hours: By appointment
E-mail: nmin2@unl.edu; jessica.m.namkung@gmail.com
Phone: 402-472-3948
Class location: Barkley 130
Class time: Tue., 1:00-3:50
Prerequisites: SPED 201, Sophomore standing

Course Description

This methodological course provides students with knowledge and skills for teaching mathematics to those with mathematics learning disabilities (or difficulties). The course consists of three components. The first focuses on the potential causes and characteristics of mathematics learning disabilities. The second emphasizes various evidence-based instructional procedures (e.g., explicit instruction, peer assisted learning strategies, strategies instruction) and how they can (or should) be used to address specific deficits and domains of mathematics learning (e.g., early numeracy, fractions). Lastly, the course provides introduction to formal and informal assessments in mathematics, and applying data-based decision-making to guide instruction.

Course Competencies

Following the completion this course students will be able to:

- Understand cognitive processes in mathematics and how those processes may be impacted by mathematics disabilities.
- Describe primary areas of difficulty for students with mathematics learning disabilities.
- Determine how to pair instructional methodologies with specific difficulties students face in learning mathematics due to mathematics disabilities (e.g., Explicit Instruction, Peer Assisted Learning, Strategy Instruction, Mnemonics, Schema-Based Instruction)
- Use assessments and error analysis to make data-based decisions for adapting mathematics instruction to meet students' needs (or to develop mathematics interventions).

Textbook

Archer, A. L., & Hughes, C. A. (2011). *Explicit instruction: Effective and efficient teaching*. Guilford Press.

Additional Readings

Weekly article readings are arranged on Canvas in folders. Each folder is identified as a particular class and topic exactly as stated on the Course Schedule of Events. You will need to read each article/chapter for a class **prior to attending that class**.

- Geary, D.C. (2004). Mathematics and learning disabilities. *Journal of Learning Disabilities, 37*, 4-15.
- Gersten R, Beckman S, Clarke B, Foegen A, Marsh L, Star JR, Witzel B. Assisting students struggling with mathematics: Response to intervention (RtI) for elementary and middle schools (NCEE 2009-4060). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education
- Hughes, E. M., Powell, S. R., & Stevens, E. A. (2016). Supporting clear and concise mathematics language: Instead of that, say this. *Teaching Exceptional Children, 49*, 7-17.
- Jayanthi M., Gersten R., Baker S. (2008). Mathematics instruction for students with learning disabilities or difficulty learning mathematics: A guide for teachers. Portsmouth, NH: RMC Research Corporation, Center on Instruction.
- McNamara, J. and Shaughnessy, M.M. (2011). *Student errors: What can they tell us about what students Do understand?* Sausalito, CA: Math Solutions.
- Montague, M., Warger, C., & Morgan, T. H. (2000). Solve it! Strategy instruction to improve mathematical problem solving. *Learning Disabilities Research & Practice, 15*, 110-116.
- Ok, M. W., Kim, M. K., Kang, E. Y., & Bryant, B. R. (2015). How to find good apps: An evaluation rubric for instructional apps for teaching students with learning disabilities. *Intervention in School and Clinic, 51*, 244-252.
- Powell, S. R., & Stecker, P. M. (2014). Using data-based individualization to intensify mathematics intervention for students with disabilities. *Teaching Exceptional Children, 46*, 31-37.
- Riccomini, P. J., Stocker Jr, J. D., & Morano, S. (2017). Implementing an effective mathematics fact fluency practice activity. *Teaching Exceptional Children, 49*, 318-327.

Course Policies

Attendance Policy

Students are expected to attend all classes (arrive on time and stay for the entire class period). Students with **no absences** during the semester will earn **2 bonus points**. Students with **one absence** earn **no bonus points**. Each additional absence (excused or unexcused) results in 2 points being deducted from the student's final course score. Two tardies (arriving late or leaving early) will result in one absence.

You are responsible for submitting your assignment on time **even if** you are absent on the day that the assignment is due unless extenuating circumstances prevail for which documentations is available. If you are absent, you are responsible for emailing the instructor either **prior to** your absence **or within 48 hours** of your absence to make arrangements for your missed quizzes and in-class activities. All makeup quizzes and in-class activities must be made up **within one week** of the

day you were absent. Any make-up work will be graded for accuracy. Failure to make arrangements and submit makeup work within the specified time will result in receiving a score of 0 on the missed work unless extenuating circumstances prevail for which documentations is available.

If you must miss a class, please do NOT ask the instructor, "Did I miss anything important in class?" The answer is, "YES. You must first get someone's notes and go over them. Then contact the instructor if you have any questions." Handouts and supplementary materials are **often** distributed during class. You are responsible for obtaining copies of these materials if you miss class the day they are distributed.

Late Assignments

Assignments are to be submitted on the due dates specified on the syllabus. One point will be deducted for each day an assignment is turned in late. Assignments will not be accepted after one week from the scheduled due date. At that time, students will receive a score of 0 on the assignment. The only exception is if a student makes arrangements with the instructor at least one week prior to the assignment due dates, or extenuating circumstances prevail for which documentations is available. Assignments may not be redone after they are submitted in order to obtain a higher score.

Computers/Cellphones

- No laptops are permitted in the classroom at anytime. The only exception is if a student is receiving services through *Services for Students with Disabilities* contacts the instructor.
- Cellphones may not be taken out at anytime in the classroom. However, students are free to use their cellphones at the break. All cell phones must be silenced before entering the classroom. Using cellphone (e.g., texting, web searching) during class time will result in 1 point being deducted from the student's final course score.

Assignments and Grading

Assignments	Points
In-Class Activities and Participation	(5 pts x 11) = 55
Quiz (Lowest Quiz Grade Dropped)	(5pts x 10) – 5 = 45
IRIS Module	20
Explicit Instruction Video Critique	20
Fluency Building App. Evaluation	10
Error Analysis	20
Lesson Plan Draft & Peer Feedback	10
Final Lesson Plan	50
Take-Home Final	60
Total	290

Detailed handouts for each assignment will be provided.

Point Percentage	Letter grade	GPA
98% - 100%	A+	4.0
93% - 97%	A	4.0

90% - 92%	A-	3.67
88% - 89%	B+	3.33
83% - 87%	B	3.0
80% - 82%	B-	2.67
78% - 79%	C+	2.33
73% - 77%	C	2.00
70% - 72%	C-	1.67
68% - 69%	D+	1.33
63% - 67%	D	1.00
60% - 62%	D-	.67

WARNING!

Students in the College of Education and Human Sciences are required to obtain a minimum grade of C+ or higher (depending on the major) in SPED 414 in order to either move into certain majors, student teach, and/or graduate. Therefore, it is imperative that students monitor their scores on Canvas and adjust their study habits/performance accordingly. All grades are final and based solely on the point total ranges indicated in the syllabus. There are no exceptions and no options for extra credit or to redo assignments.

Live Text

If not already purchased, students should obtain a Live Text membership online (<https://www.livetext.com/misk5/c1/purchase>). Besides submitting a copy of the lesson plan assignment to the instructor, students must also submit an electronic copy of it on Live Text. Live Text is used by the College of Education and Human Sciences to demonstrate the quality of our academic programs, improve the teaching and learning process, and monitor student mastery of professional competencies.

Academic Ethics/Honesty

Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University supports a Student Code of Conduct, which addresses the issue of academic dishonesty.

All students will follow the UNL Graduate Studies guidelines related to academic honesty, plagiarism, and related issues. Students are expected to contribute their own original work on all assignments and appropriately acknowledge references and resources. Failure to maintain academic ethics/honesty including avoidance or cheating, plagiarism, collusion, and falsification will result in a grade of "F" in the course, and may result in charges being issued, hearings held, and/or sanctions being imposed.

Diversity Statement/Accommodation

The University of Nebraska-Lincoln is committed to a pluralistic campus community through Affirmative Action and Equal Opportunity. We assure reasonable accommodation under the American with Disabilities Act.

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students **must be registered** with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY. Accommodations identified on the individualized accommodation plan will be provided starting on the day of receiving proper documentation. The instructor will not provide retroactive accommodations on missed work and absences prior to submitting the documentation.

Criminal History

If your criminal history changes after your first background check, please complete the Self-Report form within 48 hours of the violation found on the CEHS website (<http://cehs.unl.edu/cehs/cehs-criminal-history-background-checks/>). If you have any questions, please email CEHSbackground@unl.edu.

Academic Freedom

Over the course of this semester we may address a variety of controversial topics including matters of race, gender, culture, religion, morality, sexuality, and violence. You have a right to believe whatever you believe about such matters and are encouraged to express your views on all matters relevant to the course, even if others in the class may be offended or upset by those views. You also have the right to express disagreement with whatever views I, or others in the class, express. Finally, you have the right to decide whether or not to modify your views. Your grade in the class will be based on understanding and reasoning, not on your opinion.

Date	Topics	Readings	In-Class Activity	Assignment due
1/8	<ul style="list-style-type: none"> • Introduction • Groups & Buddies 			
1/15	<ul style="list-style-type: none"> • Cognitive Model of Mathematics • Cognitive Characteristics of Students with MD 	Geary (2004)	Accommodations and Modifications	Quiz
1/22	<ul style="list-style-type: none"> • Academic Characteristics of Students with MD • Conceptual/Procedural Knowledge <ul style="list-style-type: none"> ○ NE Math Standards Introduction to Evidence-Based Practices for Students with MD		Standards; Linking Academic Difficulties to Cognitive Difficulties	
1/29	<ul style="list-style-type: none"> • EBP1: Explicit Instruction 	Archer & Hughes (Chapter 1)	Lesson Plan Practice	Quiz
2/5	<ul style="list-style-type: none"> • EBP1: Explicit Instruction-Skills and Strategies 	Archer & Hughes (Chapter 2)	Lesson Plan Practice	Quiz
2/12	<ul style="list-style-type: none"> • EBP2: Mathematics Vocabulary & Symbols 	Archer & Hughes (Chapter 3)	Jigsaw: Hughes et al. (2016)	Quiz
2/19	IRIS Module (MTSS/RTI in Mathematise)			Iris Module (3:50 pm)
2/26	<ul style="list-style-type: none"> • Explicit Instruction: Rules • EBP3: CRA Strategy 	Archer & Hughes (Chapter 4)	Explicit Instruction Video Mini lesson review	Quiz
3/5	<ul style="list-style-type: none"> • EBP4: Fluency Building (Basic Arithmetic Facts & Computations) 	Riccomini et al. (2017)	App. Evaluation	Quiz Explicit Instruction Video Evaluation
3/12	<ul style="list-style-type: none"> • EBP5: Progress Monitoring and Data-Based Instruction • Fractions: addition and subtraction 	Powell & Stecker (2014)	Analyze Progress & Plan Instruction	Quiz
3/19	No Class: Spring Break			
3/26	<ul style="list-style-type: none"> • EBP6: Peer Assisted Learning Strategies • Fractions: multiplication and division 	Fuchs et al. (2001)	Lesson Plan Example Scoring	Quiz
4/2	<ul style="list-style-type: none"> • EBP7: Cognitive Strategy Instruction • Integers: working with positive and negatives 	Montague et al. (2000)	Lesson Plan Peer Feedback	Quiz Lesson Plan Draft
4/9	<ul style="list-style-type: none"> • EBP 8: Error Analysis • Algebraic equations/expressions 	McNamara & Shaughnessy (2011)		Quiz Lesson Plan
4/16	Meet as Groups for Error Analysis			Error Analysis
4/23	<ul style="list-style-type: none"> • Review for Take-Home Final 			