George Mason University
College of Education and Human Development
Mathematics Education Leadership

EDCI 702 6M5 – Internship in Mathematics Education
3 Credits, Spring 2021
Wednesdays/7:20-10:00 p.m. Online Synchronous & Asynchronous

Faculty

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COVID 19 Procedures: Spring 2021

Students, please be aware of and follow all policies and procedures for Mason's Safe Return to Campus: https://www2.gmu.edu/Safe-Return-Campus

Prerequisites/Corequisites
This course should be taken within the last two semesters of the MEL program or with special permissions from the instructor.

University Catalog Course Description
Offers practical experiences and professional challenges for mathematics leaders in authentic educational settings. Activities emphasize school-based and classroom-based research and leadership. Develops the skills and abilities of the mathematics leaders to analyze classroom practice, investigate teaching and disseminate information about mathematics education in professional development settings for teachers.

Course Overview
Not Applicable.

Course Delivery Method
This course will be delivered online (76% or more) using a synchronous and asynchronous format via Blackboard Learning Management system (LMS) housed in the MyMason portal. You will log in to the Blackboard (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on Monday, January 25, 2021.

Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Requirements

To participate in this course, students will need to satisfy the following technical requirements:

- High-speed Internet access with standard up-to-date browsers. To get a list of Blackboard's supported browsers see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#supported-browsers

  To get a list of supported operation systems on different devices see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#tested-devices-and-operating-systems

- Students must maintain consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course.
- Students will need a headset microphone for use with the Blackboard Collaborate web conferencing tool.
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements.
- The following software plug-ins for PCs and Macs, respectively, are available for free download:
  - Adobe Acrobat Reader: https://get.adobe.com/reader/
  - Windows Media Player: https://support.microsoft.com/en-us/help/14209/get-windows-media-player
  - Apple Quick Time Player: www.apple.com/quicktime/download/

Expectations

- Course Week: Our course week will begin on the day that our synchronous meetings take place as indicated on the Schedule of Classes.
- Log-in Frequency:
  Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least 3 times per week. In addition, students must log-in for all scheduled online synchronous meetings.
- Participation:
  Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.

- Technical Competence:
  Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- Technical Issues:
  Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- Workload:
  Please be aware that this course is **not** self-paced. Students are expected to meet *specific deadlines* and *due dates* listed in the **Class Schedule** section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- Instructor Support:
  Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.
- Netiquette:
  The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. *Be positive in your approach with others and diplomatic in selecting your words*. Remember that you are not competing with classmates, but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- Accommodations:
  Online learners who require effective accommodations to insure accessibility must be registered with George Mason University Disability Services.

Learner Outcomes or Objectives

Develop the skills and abilities of the mathematics specialist to analyze classroom practice, investigate teaching and disseminate information about mathematics education in professional development settings for teachers.

Professional Standards (National Council of Teachers of Mathematics (NCTM))

Upon completion of this course, students will have met the following professional standards:

A. Standard 6: Professional Knowledge and Skills

a. Take an active role in their professional growth by participating in professional development experiences that directly relate to the learning and teaching of mathematics and to their development as a mathematics instructional leader.

c. Plan, develop, implement, and evaluate mathematics-focused professional development programs at the school and/or district level; use and assist teachers in using resources from professional mathematics education organizations such as teacher/leader discussion groups, teacher networks, and print, digital, and virtual resources/collections; and support teachers in systematically reflecting on and learning from their mathematical practice.

d. Demonstrate mathematics-focused instructional leadership through actions such as coaching/mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps; developing appropriate classroom or school level learning environments; and collaborating with school-based professionals to develop evidence-based interventions for high and low-achieving students.

B. Standard 6: Professional Knowledge and Skills

a. Take an active role in their professional growth by participating in professional development experiences that directly relate to the learning and teaching of mathematics and to their development as a mathematics instructional leader.

c. Plan, develop, implement, and evaluate mathematics-focused professional development programs at the school and/or district level; use and assist teachers in using resources from professional mathematics education organizations such as teacher/leader discussion groups, teacher networks, and print, digital, and virtual resources/collections; and support teachers in systematically reflecting on and learning from their mathematical practice.

d. Demonstrate mathematics-focused instructional leadership through actions such as coaching/mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps; developing appropriate classroom or school level learning environments; and collaborating with school-based professionals to develop evidence-based interventions for high and low-achieving students.

C. Standard 7: Elementary Mathematics Specialist Field Experiences and Clinical Practice

a. Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator that involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners in a variety of school and professional development settings and the development of interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others.

b. Develop and use leadership skills to improve mathematics programs at the school and/or district level, e.g., coaching/mentoring new and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teaching; keeping abreast of local, state, or national policy decisions related to mathematics education; communicating to educational constituents about students, curriculum, instruction, and assessment; collaborating to create a shared vision and to develop an action plan for school improvement; and partnering with school-based professionals to improve each student's achievement.

Required Texts

Samaras, A. P. (2010). *Self-study teacher research: Improving your practice through collaborative inquiry*. Sage.

Recommended Texts

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all.* NCTM.

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

- **Assignments and/or Examinations**
  - **Participation (20%)**

    Attendance
    - Attend all scheduled online meetings for the entire class period is a course expectation and absence will impact your grade
    - Arrive to all scheduled meetings on time
    - Notify your instructor in advance if you will miss class and work with peers for

missed material

Assignments

- Complete all assignments on time.
- All assignments will be assessed using posted criteria known to the student.
- For full consideration, all assignments are due to professor *electronically* in the digital drop box prior to the beginning of class on the day they are due, unless otherwise announced.
- All written assignments are to be word-processed using Times Roman 12 pt font, double-spaced, and POSTED electronically on our class Blackboard drop box. Please title each assignment with your last name and the name of the project/assignment, e.g., Smith. Professional Development Plan.

Readings, Class Activities, and Online Participation

- Complete all readings prior to class
- Participate in class and all online discussions with openness, consideration, and effort to "hear for" and "listen to" others as you also seek to be understood.
- Come to class prepared to contribute your critical reflections on both your own experiences and ideas presented by your critical friends.
- Demonstrate positive and collaborative professional dispositions towards colleagues during peer review along with a willingness to accept constructive criticism.

Critical Friend Work

- Work with a critical friend(s) to catalogue your research.
- Share weekly updates in class, send and respond to critical friend research memos. These memos are designed to co-support each other's research and to provide alternative perspectives on interpretation to increase the validity of your research. Critical friends provide support as well as a feedback loop to improve our practice. It is *critical* to have friends in research but critical friends are *not critical* in their approach with each other.
- Brainstorm ideas as a teacher about the classroom dilemma you are researching and ideas for strategies and lessons
- Share how you are integrating standards in meaningful ways
- Share peer review of your research report.
- Establish ground rules with "critical friends" and visit them often.
- Use your blackboard space to post and respond to each other's memos in the "Critical Friend." Critical friend inquiry (CFI) assignments are listed in the course schedule.

Weekly Researcher Log

- Post your weekly updates and progress of your teacher research project each week on your personal researcher log. **(See Self-Study Research Project Timeline in Chapter 2. Table 2.2)**. This is your tentative timeline and tool to self-regulate your progress and the research process.

Participation Rubric				
Category	**Exemplary**	**Accomplished**	**Developing**	**Undeveloped**
	30 Points	27-29 Points	25-26 Points	Below 25 Points
Attendance/ Participation Attendance and participation are critical components of this course. Participation creates opportunities to learn from one another and to build a positive classroom experience and community. Participants contribute to others' learning in critical friend work by actively listening, exchanging ideas, sharing learning from reading and websites, and supporting each other's efforts.	Participates regularly and substantively in discussions and activities Promotes conversation focused on the topic Demonstrates a high level of understanding of assigned readings through verbal contributions Prompts peer feedback and input Listens actively to peers	Participates regularly in discussions and activities Demonstrates purposeful reflection on assigned readings through verbal contributions Frequently involves peers in discussion	Participates occasionally in discussions and activities Reveals some thoughts on assigned readings through verbal contributions Follows rather than leads group activities. Solicits some peer discussion Misses classes or is late for class	Does not participate in discussions and activities Offers little or no evidence of reflection on assigned readings Shows little concern for peers' learning or input. Misses classes and is late for class Does not make up work

- **Professional Development Design (30%)**
  (*NCTM NCATE* 6a, 6c, 6d)
  - This is a Performance Based Assessment. The student will design, develop, implement and refine a professional development experience (1-2 hours) for teachers. This should include a plan for the session and a written reflection paper about the professional development experience (3-5 pages) For a complete rubric and grading criteria please see the rubric at the end of the syllabus. The final report will be submitted on Blackboard in Tk20. No Google links will be accepted.

- **Teacher Research Project Report & Presentation (50%)**
  (*NCTM NCATE* 7a, 7b)
  - This is a Performance Based Assessment. You are required to write a final report that includes the following sections: Rationale/Introduction, Research Question, Review of Related Literature, Method, Context, Participants, Data Collection, Analysis, Findings, Limitations, and Discussion including your reflections of self-study and implications for practice/further research. Your

project should be useful to you and your students. A written report that includes the specific headings and subheading are listed in Chapter 12 of the textbook. For a complete rubric and grading criteria please see the rubric at the end of the syllabus. The final report will be submitted on Blackboard in Tk20. No Google links will be accepted.

In addition to the final report, students will submit assignments throughout the semester that will support the development and implementation of their project. Finally, students will present their findings in the last class session of the semester. Information on presentations will be provided in class and on Blackboard.

- **Other Requirements**
  All assignments require APA formatting:

American Psychological Association (2020*). Publication manual of the American psychological association*. APA.

Specifically, the following aspects of APA formatting should be addressed in any submission:

- 12 point, Times New Roman font
- Double spaced
- Page headers/Running head
- Cover page with title, author's name and professional affiliation
- References
- Headings
- Citations
- Clearly organized, grammatically correct, coherent and complete
- Professional language (i.e., no jargon)

TK20/Performance-Based Assessment(s) Submission Requirement:

Every student registered for any Mathematics Education Leadership course with a required TK20 performance-based assessment (designated as such in the syllabus) must submit these assessments to Tk20 through ***'Assessments'*** in Blackboard. Failure to submit the assessment(s) to Tk20 (through Blackboard) will result in the course instructor reporting the course grade as Incomplete (IN). Unless this grade is changed upon completion of the required Tk20 submission, the IN will convert to an F nine weeks into the following semester.

- **Attendance**
  It is your responsibility to attend all class sessions. You are held accountable for all information from each class session whether you are present or not. Reasons for any absence must be reported to the instructor in writing.

- **Tardiness**
  It is your responsibility to be on time for each class session. Reasons for any absence must be reported to the instructor in writing.

- **Course Performance Evaluation Weighting**
  20% Participation
  - Attendance
  - Readings, Class Activities and Online Participation
  - Critical Friend Work
  - Weekly Researcher Log

  30% Professional Development Design
  50% Self-Study Teacher Researcher Project

- **Grading**
  All assignments are to be turned in to your instructor on time. **Late work will not be accepted for full credit.** Assignments turned in late will receive a 10% deduction from the grade per late day or any fraction thereof (including weekends and holidays).

  The final evaluation criteria utilizes the graduate grading scale and is as follows:

A	93%-100%	B+	87%-89%	C	70%-79%
A-	90%-92%	B	80%-86%	F	Below 70%

- **For Master's Degrees**:
  Candidates must have a minimum GPA of 3.00 in coursework presented on the degree application, which may include no more than 6 credits of C. (Grades of C+, C-, or D do not apply to graduate courses. The GPA calculation excludes all transfer courses and Mason non-degree studies credits not formally approved for the degree).

- **For Endorsement Requirements**
  Candidates must have a grade of B or higher for all licensure coursework (endorsement coursework).

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times. Education professionals are held to high standards, both inside and outside of the classroom. Educators are evaluated on their behaviors and interactions with students, parents, other professionals, and the community at large. At the College of Education and Human Development, dispositions may play a part in the discussions and assignments of any/all courses in a student's program (and thus, as part or all of the grade for those assignments). For additional information visit:

https://cehd.gmu.edu/students/polices-procedures/

This course will require students to audiotape, videotape, or use the audio/video conferencing feature. Students should dress professionally, speak professionally, and aware of their recording surroundings and backgrounds. Background noise (such as television, music, conversations, etc.) and inappropriate background video are distracting, unprofessional, and not allowed in this course.

Class Schedule

All readings are from Samaras (2010) unless otherwise noted.

	Topic	Self-Study Project Timeline and Assignments Due	Professional Development Project Assignments Due
Week 1 1/27 **Format** Synchronous	**Introduction to Course** Overview of Self-Study Teacher Research Process and Project Critical Friend Blogs: Access & Expectations	Start noticing your classroom. Brainstorm possible research topics.	
Week 2 2/3 **Format** Synchronous	**In-Class CFI BLOG POST** (Start) CFI 1.1 (p. 5-6) CF Response	Read: Preface, Chapters 1 & 2 SKIM Chapter 12 Gather Literature	
Week 3 2/10 **Format** Synchronous	**Research Question** **In-Class CFI BLOG POST (Start):** CFI 5.3 (p. 104-105) CF Response **Educational Databases Anne Driscoll**	Read: Chapter 5 Gather Literature **BLACKBOARD DB POST:** Prepare and post questions for Anne Driscoll. Brainstorm your keywords **CFI BLOG POST:** CFI 5.1 (p. 96-97) CF Response	**BLACKBOARD ASSIGNMENT POST:** Topics and Goals for PD Session
Week 4 2/17 **Format** Synchronous	**Research Design** **In-Class CFI BLOG POST:** CFI 4.1 (p. 82) Response to CF	Read: Chapters 6 & 7 Gather Literature **CFI BLOG POST:** CFI 5.3 CF Response	
Week 5 2/24 **Format**	**Research Ethics** **In-Class BLACKBOARD ASSIGNMENT POST:**	Read: Chapters 8 & 9 Gather Literature	Be ready to share your Professional Development Session Plan FULL DRAFT with CF in class.

Asynchronous	Research Proposal **Professional Development Project Collaboration** **In-Class CFI BLOG POST:** CFI 7.1 CF Response		
Week 6 3/3 **Format** Synchronous	**Professional Development Project Collaboration** **Data Collection Brainstorm & Identification** **Review & Update CFI 8.1**	Read: Chapters 10 & 11 Gather Literature **CFI BLOG POST:** CFI 8.1	**BLACKBOARD ASSIGNMENT POST:** Professional Development Session Plan Due for Instructor Feedback
Week 7 3/10 **Format** Asynchronous & Blackboard Collaborate Consults	**Data Collection Workshop** **CFI BLOG POST:** CF Response	Begin Data Collection **Finalize & Reflect on CFI 8.1**	
Week 8 3/17 **Format** Asynchronous & Blackboard Collaborate Consults	**Literature Review Workshop** **BLOG POST:** Data Collection Reflection	Continue Data Collection **BLACKBOARD ASSIGNMENT POST:** Literature Review Due Identify Specific Questions/Areas (As Needed)	
Week 9 3/24 **Format** Synchronous	**Data Collection Workshop** **Problems of Practice** **Class Analysis of Data**	Read Chapter 9 Continue Data Collection & Analysis **BLOG POST:** CF Response to Data Collection Reflection	Bring Problem of Practice & Peer Access to Data **BLACKBOARD POST & BRING:** Update on PD Session Plan *Present PD before Week 12 if possible. Consult the instructor if you need to adjust.*
Week 10 3/31 **Format** Asynchronous	**Writing Class Workshop** **In-Class CFI BLOG POST:** CF Response 9.1	Read One Sample Paper Continue Data Collection Continue Analyzing Data	

Week 11 4/7 **Format** Synchronous	**Data Collection Workshop** **Problems of Practice** **Class Analysis of Data** **Critical Friend Workshop** **In-Class CFI BLOG POST:** CF Response CFI 11.1	Read Chapter 11 Read One Sample Paper Data Analysis Summarize Findings Dialogue About Findings	Bring Problem of Practice & Peer Access to Data
Week 12 4/14 **Format** Synchronous	**Data Collection Workshop** **Problems of Practice** **Class Analysis of Data** **Discuss Paper Drafts** CFI 11.2 **Collaborate Instructor Consults**	Research Paper Draft to CF **BLACKBOARD ASSIGNMENT POST:** Research Paper Draft to Instructor Identify Specific Questions/Areas (As Needed)	Bring Problem of Practice & Peer Access to Data
Week 13 4/21 **Format** Asynchronous	**Critical Friend Work** CFI 11.3 **Optional Collaborate Instructor Consults**	Feedback on Research Paper to CF	**BLACKBOARD POST:** Final PD Plan, Materials & Reflection Uploaded
Week 14 4/28 **Format** Asynchronous	**Critical Friend Work** **Optional Collaborate Instructor Consults**	Read Chapter 13	
Week 15 5/5 **Format** Synchronous	**Research Presentation** Exit Reflection on Professional Growth and Continued Goals	Bring Electronic Copies of Research Flyer to Class **BLACKBOARD ASSIGNMENT POST:** Research Flyer **BLACKBOARD POST:** Final Research Paper	

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: http://cehd.gmu.edu/values/.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see https://catalog.gmu.edu/policies/honor-code-system/).

- Students must follow the university policy for Responsible Use of Computing (see https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).

- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.

- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see https://ds.gmu.edu/).

- Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or https://cehd.gmu.edu/aero/tk20. Questions or concerns regarding use of Blackboard should be directed to https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/.

- For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Responsible Employee," and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek

assistance from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website https://cehd.gmu.edu/students/ .

Professional Development Project Description

Course Performance Based Assessment

This is a Performance Based Assessment. The student will design, develop, refine, implement and reflect on a professional development experience (approximately 60 minutes) for teachers, administrators or other educational professionals. The final product should include the following: 1) topic identification and rationale; 2) an implementation plan; 3) all materials used or accessed; and 4) a written reflection paper about the professional development experience. The final report will be submitted on Blackboard in Tk20. For a complete rubric and grading criteria please see the rubric at the end of the syllabus.

TOPIC IDENTIFICATION & RATIONALE

Professional development should be centered on relevant and specific mathematics topics. In this project, a rationale is provided that specifically explains the connection of the professional development to the following: the school or district's needs, the promotion of mathematics instruction within the targeted audience, local, state and/or national goals for mathematics instruction. Things to consider are:

- **A Clearly Defined Focus and Purpose:** What is the topic you will base your professional development on?
- **A Rationale for Why This Topic Matters:** What is going on in your classroom which brings your attention to this topic? Why are you interested in this topic and why does it matter to you, other teachers/administrators, your district, and the field?

IMPLEMENTATION PLAN

The implementation plan should be clearly and comprehensively written so that another individual could pick up the plan with all materials and implement the professional development. This includes:

- Timing
- Materials
- Electronic downloads of materials (not weblinks)
- Anticipated responses of participants
- A focus on mathematics
- Objectives
- Detailed activities and actions
- Planned opportunities for discussion
- Questions to ask the audience
- Anticipated teacher questions
- Anticipated responses to teacher questions,

The professional development implementation plan should emphasize collaboration and take into consideration the needs of both adult and student learners. An assessment should be included to determine the impact of the professional development and future needs of the stakeholders.

Additionally, the plan should focus on making a mathematics-focused shift through one of several actions: coaching /mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps; developing appropriate classroom or school-level learning

environments; and collaborating with school-based professionals to develop evidence-based interventions for high- and low-achieving students.

REFLECTION

The candidate will reflect on the role of learning and teaching of mathematics, the role of mathematics instructional leaders, the improvement of student learning and continuing the implementation.

Professional Development Project Rubric (Course Performance-Based Assessment)				
Level/Criteria	**4**	**3**	**2**	**1**
	Exceeds Expectations	**Meets Expectations**	**Developing**	**Does Not Meet Expectations**
PROFESSIONAL DEVELOPMENT EXPERIENCE: RATIONALE & PARTICIPANTS				
PROFESSIONAL DEVELOPMENT PLAN RATIONALE **NCTM Standard 6c** **s** Plan, develop, implement and evaluate mathematics-focused professional development programs at the school and/or district levels.	The professional development description includes all of the following elements: • meets the school or district level's needs • promotes the improvement of mathematics within the school or district • explains how the facilitation of the professional development builds upon local/ state/national goals	The description includes two of the following elements: • meets the school or district level's needs • promotes the improvement of mathematics within the school or district • explains how the facilitation of the professional development builds upon local/ state/national goals	The description includes one of the following elements: • meets the school or district level's needs • promotes the improvement of mathematics within the school or district • explains how the facilitation of the professional development builds upon local/ state/national goals	The description does not include any of following elements: • meets the school or district level's needs • promotes the improvement of mathematics within the school or district • explains how the facilitation of the professional development builds upon local/ state/national goals
CONNECTING TO RATIONALE **NCTM Standard 7a** Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics	The professional development plan is based on observational data for the school or district. The plan includes an analysis of the school or district environment AND an explanation of	The professional development plan is based on observational data for the school or district. The plan includes an analysis of the school or district environment OR an explanation of how this	The professional development plan is based on observational data for the school or district. The plan does not include an analysis of the school or district environment and does not include	The professional development plan is not based on observational data for the school or district.

educator that involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners in a variety of school and professional development settings and the development of interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others.	how this professional development experience will impact student learning.	professional development experience will impact student learning.	an explanation of how this professional development experience will impact student learning.	
PARTICIPANT INVOLVEMENT **NCTM Standard 7b** Develop and use leadership skills to improve mathematics programs at the school and/or district level, e.g., collaborating to create a shared vision and to develop an action plan for school improvement; and partnering with school-based professionals to improve each student's achievement.	Teachers and leaders at the school or district level are participants in the professional development experience. Teachers and leaders at the school or district level are encouraged to try a new practice that enhances the current mathematical teaching practices.	Teachers and leaders at the school or district level are participants in the professional development experience. Teachers and leaders at the school or district level are encouraged to try a new mathematical teaching practice.	Teachers and leaders at the school or district level are participants in the professional development experience. Teachers and leaders at the school or district level are not encouraged to try a new mathematical teaching practice.	Teachers and leaders at the school or district level are not involved as participants in the professional development experience.
PROFESSIONAL DEVELOPMENT EXPERIENCE: THE PLAN				
SESSION PLAN	The plan includes sufficient detail for someone else	The plan includes sufficient detail for someone else	Some details necessary for implementation	No details for implementation

NCTM Standard 7b Develop and use leadership skills to improve mathematics programs at the school and/or district level, e.g., coaching/mentoring new and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teaching; keeping abreast of local, state, or national policy decisions related to mathematics education; communicating to educational constituents about students, curriculum, instruction, and assessment; collaborating to create a shared vision and to develop an action plan for school improvement; and partnering with school-based professionals to improve each student's achievement.	to implement the session. The organization of the plan is both logical AND clear.	to implement the session. Some components of the plan may be difficult to follow OR lack logical and/or clear organization.	of the plan are missing. Some components of the plan may be difficult to follow OR lack logical and/or clear organization.	of the plan are given. It would be very difficult for someone else to implement the session due to a lack of logical and/or clear organization.
COACHING ACTIONS **NCTM Standard 6d** Demonstrate mathematics-focused	The professional development provides mathematics-focused instructional leadership	The professional development provides mathematics-focused instructional leadership	The professional development provides mathematics-focused instructional leadership	The professional development does not focus on one of the following actions:

instructional leadership through actions such as coaching /mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps; developing appropriate classroom or school-level learning environments; and collaborating with school-based professionals to develop evidence-based interventions	through one of the following actions: • coaching /mentoring • building and navigating relationships with teachers, administrators, and the community • establishing and maintaining learning communities • analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction • leading efforts to assure that all students have opportunities to learn important mathematics • evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making	through one of the following actions: • coaching /mentoring • building and navigating relationships with teachers, administrators, and the community • establishing and maintaining learning communities • analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction • leading efforts to assure that all students have opportunities to learn important mathematics • evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making	through one of the following actions: • coaching /mentoring • building and navigating relationships with teachers, administrators, and the community • establishing and maintaining learning communities • analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction • leading efforts to assure that all students have opportunities to learn important mathematics • evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making	• coaching /mentoring • building and navigating relationships with teachers, administrators, and the community • establishing and maintaining learning communities • analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction • leading efforts to assure that all students have opportunities to learn important mathematics • evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and

for high- and low-achieving students.	recommendations for addressing learning and achievement gaps • developing appropriate classroom or school-level learning environments • collaborating with school-based professionals to develop evidence -based interventions for high- and low-achieving students The identified action is well-developed AND thoroughly described.	recommendations for addressing learning and achievement gaps • developing appropriate classroom or school-level learning environments • collaborating with school-based professionals to develop evidence -based interventions for high- and low-achieving students The identified action is well-developed OR thoroughly described.	recommendations for addressing learning and achievement gaps • developing appropriate classroom or school-level learning environments • collaborating with school-based professionals to develop evidence -based interventions for high- and low-achieving students The identified action is not well developed AND is not thoroughly described.	achievement gaps • developing appropriate classroom or school-level learning environments collaborating with school-based professionals to develop evidence -based interventions for high- and low-achieving students
OBJECTIVES & ACTIVITIES **NCTM Standard 6c** Plan, develop, implement, and evaluate mathematics-focused professional development programs at the school and/or district level.	Professional development is mathematics-focused. The plan clearly outlines objectives for the session AND describes detailed activities the teachers will engage in during the session. The plan provides	Professional development is mathematics-focused. The plan outlines objectives for the session AND lists activities the teachers will engage in during the session. The plan provides opportunities for	Professional development is mathematics-focused. The plan outlines objectives for the session OR lists activities the teachers will engage in during the session.	Professional development is not mathematics-focused. The objectives for the session and the opportunities for interaction are missing.

	substantive opportunities for interaction and discussion of the topics.	interaction and discussion of the topics.		
RESOURCES & SUPPLEMENTARY MATERIALS **NCTM Standard 6c** Use and assist teachers in using resources from professional mathematics education organizations such as teacher/leader discussion groups, teacher networks, and print, digital, and virtual resources/ collections.	Professional development resources for teachers come from professional mathematics education organizations. Professional development handouts and other documents (i.e. articles) meet all of the following requirements: • easy to follow/read • error-free • included or linked within the plan	Professional development resources for teachers come from professional mathematics education organizations. Professional development handouts and other documents (i.e. articles) meet two of the following requirements: • easy to follow/read • error-free • included or linked within the plan	Professional development resources for teachers come from professional mathematics education organizations. Professional development handouts and other documents (i.e. articles) meet one of the following requirements: • easy to follow/read • error-free • included or linked within the plan	Professional development resources for teachers do not come from professional mathematics education organizations. Professional development handouts and other documents (i.e. articles) do not meet the following requirements: • easy to follow/read • error-free • included or linked within the plan
MEETING LEARNERS' NEEDS **NCTM Standard 7a** Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator that	The professional development plan takes into consideration adult and student learners. Specific considerations for adult learners AND student learners are articulated in the professional	The professional development plan takes into consideration adult and student learners. Specific considerations for either adult learners OR student learners are clearly articulated in the professional	The professional development plan takes into consideration adult and student learners. Specific considerations for adult learners and student learners are not articulated in the professional	The professional development plan does not take into consideration adult and student learners.

involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners in a variety of school and professional development settings and the development of interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others.	development plan.	development plan.	development plan.	
QUESTIONS FOR TEACHERS **NCTM Standard 6c** Support teachers in systematically reflecting on and learning from their mathematical practice.	The plan includes questions for teachers with all of the following characteristics: • high cognitive demand (requiring higher-order thinking) • alignment with objectives/plan for the session • conducive to group/partner discussion The plan includes anticipated questions from teachers.	The plan includes questions for teachers with two of the following characteristics: • high cognitive demand (requiring higher-order thinking) • alignment with objectives/plan for the session • conducive to group/partner discussion The plan includes anticipated questions from teachers.	The plan includes questions for teachers with one of the following characteristics: • high cognitive demand (requiring higher-order thinking) • alignment with objectives/plan for the session • conducive to group/partner discussion The plan does not include anticipated questions from teachers.	The plan includes does not include questions for teachers or includes questions without the following characteristics: • high cognitive demand (requiring higher-order thinking) • alignment with objectives/plan for the session • conducive to group/partner discussion The plan does not include anticipated

				questions from teachers.
COLLABORATION **NCTM Standard 7a** Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator involve the development of interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others.	The professional development plan includes potential responses to the anticipated teacher questions. Potential responses are framed positively and highlight the important mathematical ideas/message of the professional development.	The professional development plan includes potential responses to the anticipated teacher questions. Potential responses are framed positively but do highlight the important mathematical ideas/message of the professional development.	The professional development plan includes potential responses to the anticipated teacher questions. Potential responses are not framed positively and do not include the important mathematical ideas/message of the professional development.	The professional development plan does not include potential responses to the anticipated teacher questions.
ASSESSMENT OF PARTICIPANT KNOWLEDGE AND NEED **NCTM Standard 6b** Advance the development in themselves and others as reflective practitioners.	The professional development includes an assessment (i.e. exit ticket). The assessment identifies teachers' perceptions of newly acquired knowledge and professional practices in their mathematics teaching AND allows teachers to indicate their needs and support required	The professional development includes an assessment (i.e. exit ticket). The assessment identifies teachers' perceptions of newly acquired knowledge and professional practices in their mathematics teaching OR allows teachers to indicate their needs and support required	The professional development includes an assessment (i.e. exit ticket). The assessment does not identify teachers' perceptions of newly acquired knowledge and professional practices in their mathematics teaching AND does not allow teachers to indicate their needs and support required	The professional development does not include an assessment (i.e. exit ticket).

	for implementation.	for implementation.	for implementation.	
SEQUENCE OF PLANNED FIELD EXPERIENCE **NCTM Standard 7a** Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator that involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners in a variety of school and professional development settings and the development of interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others.	The candidate uses the all steps in the following sequence to develop/ implement their professional development: 1. Develop a plan with peer collaboration. where feedback is provided 2. Modify the plan to include peer feedback. 3. Submit the plan to an experienced and highly qualified mathematics educator in advance of implementation. 4. Implement the plan in a school or district setting. 5. Reflect deeply after implementation of the plan.	The candidate uses at least four steps in the following sequence to develop/ implement their professional development: 1. Develop a plan with peer collaboration where feedback is provided 2. Modify the plan to include peer feedback 3. Submit the plan to an experienced and highly qualified mathematics educator in advance of implementation 4. Implement the plan in a school or district setting. 5. Reflect deeply after implementation of the plan.	The candidate uses at least three steps in the following sequence to develop/ implement their professional development: 1. Develop a plan with peer collaboration where feedback is provided 2. Modify the plan to include peer feedback 3. Submit the plan to an experienced and highly qualified mathematics educator in advance of implementation 4. Implement the plan in a school or district setting. 5. Reflect deeply after implementation of the plan.	Three or more of the following steps in the sequence are missing as the candidate develops/ implements the professional development plan: 1. Develop a plan with peer collaboration where feedback is provided 2. Modify the plan to include peer feedback 3. Submit the plan to an experienced and highly qualified mathematics educator in advance of implementation 4. Implement the plan in a school or district setting. 5. Reflect deeply after implementation of the plan.
PROFESSIONAL DEVELOPMENT EXPERIENCE: REFLECTION				
THE ROLE OF LEARNING &	The reflection clearly identifies how the	The reflection identifies how the professional	The reflection identifies that the professional	The reflection does not mention the

TEACHING OF MATHEMATICS **NCTM Standard 6a** Take an active role in their professional growth by participating in professional development experiences that directly relate to the learning and teaching of mathematics.	professional development experience directly related to the learning and teaching of mathematics. The reflection clearly describes the impact of the professional development experience on the candidate's personal learning and teaching of mathematics.	development experience is directly related to the learning and teaching of mathematics. The reflection clearly describes the impact of the professional development experience on either the candidate's personal learning and or the candidate's personal teaching of mathematics.	development experience is directly related to their learning and teaching of mathematics. The explanation of the professional development experience is not connected to the candidate's personal teaching and learning of mathematics.	candidate's personal teaching or learning of mathematics.
THE ROLE OF MATHEMATICS INSTRUCTIONAL LEADER **NCTM Standard 6a** Take an active role in their professional growth by participating in professional development experiences that directly relate to their development as a mathematics instructional leader.	The reflection clearly identifies how the professional development experience directly related to the candidate's development as a mathematics instructional leader. .	The reflection identifies how the professional development experience directly related to the candidate's development as a mathematics instructional leader.	The reflection does not clearly identify how the professional development experience directly related to the candidate's development as a mathematics instructional leader.	The reflection does not mention the candidate's development as a mathematics instructional leader
IMPROVE STUDENT UNDERSTANDING **NCTM Standard 7a**	The reflection identifies two important understandings of elementary student mathematical	The reflection identifies one important understanding of elementary student mathematical	The reflection identifies one understanding of elementary student mathematical development.	The reflection does not identify any important understandings of elementary student mathematical

Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator that involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners.	development that were highlighted as a result of this professional development experience.	development that was highlighted as a result of this professional development experience.	The understanding was not connected to the professional development experience.	development that were highlighted as a result of this professional development experience.
CONTINUING IMPLEMENTATION **NCTM Standard 7b** Develop and use leadership skills to improve mathematics programs at the school or district level, e.g. collaborating to create a shared vision and to develop an action plan for school improvement.	The reflection describes the next steps that the candidate would take as a mathematics instructional leader implementing the identified action. The next steps clearly articulate a plan to meet colleagues' needs with a timeline for implementation.	The reflection describes the next steps that the candidate would take as a mathematics instructional leader implementing the identified action. The next steps of include either a plan to meet colleagues' needs or a timeline for implementation.	The reflection describes the next steps that the candidate would take as a mathematics instructional leader implementing the identified action. The next steps of implementation do not include a plan to meet colleagues' needs nor a timeline for implementation.	The reflection does not describe the next steps that the candidate would take as a mathematics instructional leader implementing the identified action.

Self-Study Research Project Description

Course Performance Based Assessment

This is a Performance Based Assessment. The final research report will be submitted on Blackboard in Tk20. In addition to the final report, students will submit assignments throughout the semester that will support the development and implementation of their project including a research proposal and a draft literature review. Finally, students will present their findings in the last class session of the semester.

FIELD EXPERIENCE SEQUENCE

Throughout the semester the students will engage with both their peers and a highly qualified mathematics educator to gain individualized feedback on their projects. Students will use the following sequence to develop, implement and reflect deeply on the self-study project experience: develop planned field experience with peer collaboration where feedback is provided by a critical friend**;** modify planned field experience based upon peer feedback; frequently submit plan to an experienced and highly qualified mathematics educator for individualized feedback; and implement planned field experience in a school or district setting. Specific deadlines will be ongoing and provided by the highly qualified mathematics educator.

RESEARCH REPORT

You are required to write a final report that includes the following sections: Abstract, Rationale, Research Problem and Questions, Review of Related Literature, Method, Conceptual Framework, Context and Participants, Data Collection, Self-Study and Reflection, Findings, Implications on Teaching and Learning, Implications on Educational Field, and Critical Friend Collaboration Reflection. Your project should be useful to you and your students. A written report that includes the specific headings and subheading are listed in Chapter 12 of the textbook. Exemplars are provided on Blackboard.

The paper should be formatted in APA style with references cited appropriately. For a complete rubric and grading criteria please see the rubric at the end of the syllabus.

CLASS PRESENTATION

You are required to present your research project to your peers on the last class. Your presentation must include a one-page handout that includes: your research question, rationale/purpose/data collection/resources and tools, findings, implications for math specialists and your practice. You may use bullets, write sentences, incorporate images or charts, and add additional information as needed.

SELF-STUDY PROJECT FINAL REPORT

Write a final report that is useful to you and your context. Include the following sections:

- Rationale Introduction
- Research Question
- Review of Related Literature
- Method
- Context
- Participants
- Data Collection
- Analysis
- Findings
- Limitations
- Discussion
- Implications & Reflection

- Role of Critical Friend

Additionally, the project should focus on making a mathematics-focused shift through one of several actions: coaching /mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps; developing appropriate classroom or school-level learning environments; and collaborating with school-based professionals to develop evidence-based interventions for high- and low-achieving students.

Include specific headings and subheadings in your report listed in Chapter 12 of the textbook. The final report should be well organized, and follow APA formatting. Submit the final report on Blackboard in Tk20.

Self-Study Project Rubric (Course Performance-Based Assessment)				
Level/Criteria	4	3	2	1
	Exceeds Expectations	Meets Expectations	Developing	Does Not Meet Expectations
SELF-STUDY PROJECT: FIELD EXPERIENCE SEQUENCE				
SEQUENCE OF PLANNED FIELD EXPERIENCE **NCTM Standard 7a** Engage in a sequence of planned field experiences and clinical practice in an elementary setting and are supervised by an experienced and highly qualified mathematics educator.	The candidate uses each of the steps in the following sequence to develop, implement and reflect on the self-study project: 1. Develop planned field experience with peer collaboration where feedback is provided by a critical friend 2. Modify planned field experience based upon peer feedback 3. Frequently submit plan to an experienced and highly qualified mathematics educator for individualized feedback 4. Implement planned field experience in a school or district setting Reflect deeply upon experience during and after implementation	The candidate uses four of the steps in the following sequence to develop, implement and reflect on the self-study project: 1. Develop planned field experience with peer collaboration where feedback is provided by a critical friend 2. Modify planned field experience based upon peer feedback 3. Frequently submit plan to an experienced and highly qualified mathematics educator for individualized feedback 4. Implement planned field experience in a school or district setting Reflect deeply upon experience during and after implementation	The candidate uses three of the steps in the following sequence to develop, implement and reflect on the self-study project: 1. Develop planned field experience with peer collaboration where feedback is provided by a critical friend 2. Modify planned field experience based upon peer feedback 3. Frequently submit plan to an experienced and highly qualified mathematics educator for individualized feedback 4. Implement planned field experience in a school or district setting Reflect deeply upon experience during and after implementation	The candidate uses fewer than three steps in the following sequence to develop, implement and reflect on the self-study project: 1. Develop planned field experience with peer collaboration where feedback is provided by a critical friend 2. Modify planned field experience based upon peer feedback 3. Frequently submit plan to an experienced and highly qualified mathematics educator for individualized feedback 4. Implement planned field experience in a school or district setting Reflect deeply upon experience during and after implementation
SELF-STUDY PROJECT: RESEARCH REPORT				
ABSTRACT	The abstract has all of the following characteristics: • One paragraph with no more than 150 words	The abstract has two of the following characteristics: • One paragraph with no more than 150 words	The abstract has one of the following characteristics: • One paragraph with no more than 150 words	No abstract is included or the abstract has none of the following characteristics: • One paragraph with no more than 150 words

	• Clear and concise word choice • A description of the purpose, context, method, key findings, and significance	• Clear and concise word choice • A description of the purpose, context, method, key findings, and significance	• Clear and concise word choice • A description of the purpose, context, method, key findings, and significance	• Clear and concise word choice • A description of the purpose, context, method, key findings, and significance
RATIONALE **NCTM Element 7a** Demonstrate a broad experiential base of knowledge and skills working with a range of student and adult learners in varied school and professional development settings.	A rationale is included that provides all of the following: • Clearly and concisely explains the personal importance of this research • Clearly and concisely explains the importance of this research to the teachers in the school or district setting. • Clearly and concisely explains the importance of this research to the students in the school or district setting. • Provides perspectives that have shaped the research question Addresses the broader educational and social significance of the research	A rationale is included that provides four of the following: • Clearly and concisely explains the personal importance of this research • Clearly and concisely explains the importance of this research to the teachers in the school or district setting. • Clearly and concisely explains the importance of this research to the students in the school or district setting. • Provides perspectives that have shaped the research question Addresses the broader educational and social significance of the research	A rationale is included that provides three of the following: • Clearly and concisely explains the personal importance of this research • Clearly and concisely explains the importance of this research to the teachers in the school or district setting. • Clearly and concisely explains the importance of this research to the students in the school or district setting. • Provides perspectives that have shaped the research question Addresses the broader educational and social significance of the research	A rationale is included that provides two or fewer of the following: • Clearly and concisely explains the personal importance of this research • Clearly and concisely explains the importance of this research to the teachers in the school or district setting. • Clearly and concisely explains the importance of this research to the students in the school or district setting. • Provides perspectives that have shaped the research question Addresses the broader educational and social significance of the research
RESEARCH PROBLEM & QUESTIONS **NCTM Standard 7b** Develop and use leadership skills to	The paper includes all of the following: • The research problem and questions are connected to improving	The paper includes three of the following: • The research problem and questions are connected to	The paper includes two of the following: • The research problem and questions are connected to	The paper includes fewer than two of the following: • The research problem and questions are connected to

improve mathematics programs at the school and/or district level, e.g., coaching/mentoring new and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teaching; keeping abreast of local, state, or national policy decisions related to mathematics education; communicating to educational constituents about students, curriculum, instruction, and assessment; collaborating to create a shared vision and to develop an action plan for school improvement; and partnering with school-based professionals to improve each student's achievement.	mathematics programs at the school and/or district level. • The research problem is clearly and concisely stated. • The main research question is clearly and concisely stated. • The sub research questions (if applicable) are clearly and concisely stated.	improving mathematics programs at the school and/or district level. • The research problem is clearly and concisely stated. • The main research question is clearly and concisely stated. • The sub research questions (if applicable) are clearly and concisely stated.	improving mathematics programs at the school and/or district level. • The research problem is clearly and concisely stated. • The main research question is clearly and concisely stated. • The sub research questions (if applicable) are clearly and concisely stated.	improving mathematics programs at the school and/or district level. • The research problem is clearly and concisely stated. • The main research question is clearly and concisely stated. • The sub research questions (if applicable) are clearly and concisely stated.
REVIEW OF THE LITERATURE **NCTM Standard 7a** Develop a broad experiential base of knowledge and skills working with a range of student and adult learners in varied school and professional	The literature review includes all of the following elements: • It is connected to the research study. • It is adequate, coherent and analytical.	The literature review includes two of the following elements: • It is connected to the research study. • It is adequate, coherent and analytical.	The literature review includes one of the following elements: • It is connected to the research study. • It is adequate, coherent and analytical.	The literature review does not include the following elements: • It is connected to the research study. • It is adequate, coherent and analytical.

development settings.	• It includes references from a variety of sources.	It includes references from a variety of sources.	It includes references from a variety of sources.	It includes references from a variety of sources.
CONCEPTUAL FRAMEWORK **NCTM Standard 7a** Demonstrate a broad experiential base of knowledge and skills working with a range of student and adult learners in varied school and professional development settings.	The candidate connects and explains theories, literature, and phenomena in a way that informs the research study AND integrates the literature review into the conceptual framework.	The candidate connects and explains theories, literature, and phenomena in a way that informs the research study OR integrates the literature review into the conceptual framework.	The candidate does not connect and explain theories, literature, and phenomena in a way that informs the research study AND does not integrate the literature review into the conceptual framework.	No conceptual framework is included.
RESEARCH METHOD: CONTEXT & PARTICIPANTS **NCTM Standard 7b** Participate and encourage teachers to participate in innovative or transformative initiatives, partnerships, or research projects related to the teaching of elementary mathematics.	The research method includes all of the following: • A description of the overall research context • A description of the specific community, school, and classroom context Demographic information for the participants	The research method includes two of the following: • A description of the overall research context • A description of the specific community, school and classroom context Demographic information on the participants.	The research method includes one of the following: • A description of the overall research context. • A description of the specific community, school and classroom context. Demographic information on the participants.	The research method includes none of the following: • A description of the overall research context • A description of the specific community, school and classroom context • Demographic information on the participants
RESEARCH METHOD: SELF-STUDY & REFLECTION **NCTM Standard 7b** Develop and use leadership skills to improve mathematics programs at the school and/or district level, e.g., coaching/mentoring	The research method includes all of the following: • A reflection on the problem (e.g. observations, possible causes, etc.) • An explanation for the chosen pedagogies based on the noticing of the environment	The research method includes two of the following: • A reflection on the problem (e.g. observations, possible causes, etc.) • An explanation for the chosen pedagogies based	The research method includes one of the following: • A reflection on the problem (e.g. observations, possible causes, etc.) • An explanation for the chosen pedagogies based	The research method includes none of the following: • A reflection on the problem (e.g. observations, possible causes, etc.) • An explanation for the chosen pedagogies based

new and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teaching; keeping abreast of local, state, or national policy decisions related to mathematics education; communicating to educational constituents about students, curriculum, instruction, and assessment; collaborating to create a shared vision and to develop an action plan for school improvement; and partnering with school-based professionals to improve each student's achievement.	• An explanation for the chosen pedagogies based on the literature reviewed	on the noticing of the environment • An explanation for the chosen pedagogies based on the literature reviewed	on the noticing of the environment • An explanation for the chosen pedagogies based on the literature reviewed	on the noticing of the environment • An explanation for the chosen pedagogies based on the literature reviewed
DATA COLLECTION **NCTM Standard 5c** Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students' mathematical proficiencies have	All of the following are included in the data collection: • A detailed description of the data collected, how it was collected, and when it was collected • Data from a variety of sources. • A timeline of the data collection	At least three of the following are included in the data collection: • A detailed description of the data collected, how it was collected, and when it was collected • Data from a variety of sources. • A timeline of the data collection	At least two of the following are included in the data collection: • A detailed description of the data collected, how it was collected, and when it was collected • Data from a variety of sources. • A timeline of the data collection	Less than two of the following are included in the data collection: • A detailed description of the data collected, how it was collected, and when it was collected • Data from a variety of sources. • A timeline of the data collection

increased as a result of their instruction or their efforts in coaching/mentoring teachers.	process and planned interventions • A detailed explanation of the data analysis process so that someone else would be able to analyze the data and find similar results • An explanation of the role of the critical friend(s) in data interpretation. • A visual and coherent presentation of the data	process and planned interventions • A detailed explanation of the data analysis process so that someone else would be able to analyze the data and find similar results • An explanation of the role of the critical friend(s) in data interpretation. • A visual and coherent presentation of the data	process and planned interventions • A detailed explanation of the data analysis process so that someone else would be able to analyze the data and find similar results • An explanation of the role of the critical friend(s) in data interpretation. • A visual and coherent presentation of the data	process and planned interventions • A detailed explanation of the data analysis process so that someone else would be able to analyze the data and find similar results • An explanation of the role of the critical friend(s) in data interpretation. • A visual and coherent presentation of the data
FINDINGS: PRESENTATION **NCTM Element 7a** Demonstrate a broad experiential base of knowledge and skills working with a range of student and adult learners in varied school and professional development settings.	The findings include all of the following: • The findings are clearly and thoroughly and presented. • Themes from the findings are connected and coherently presented. • Convincing evidence is provided that supports identified themes. The research questions and the findings are connected.	The findings include three of the following: • The findings are adequately presented. • Themes from the findings are connected and coherently presented. • Convincing evidence is provided that supports identified themes. The research questions and the findings are connected.	The findings include two of the following: • The findings are adequately presented. • Themes from the findings are connected and coherently presented. • Convincing evidence is provided that supports identified themes. The research questions and the findings are connected.	The finding include fewer than two of the following: • The findings are adequately presented. • Themes from the findings are connected and coherently presented. • Convincing evidence is provided that supports identified themes. The research questions and the findings are not connected.
SELF-STUDY PROJECT: IMPLICATIONS & REFLECTION				
IMPLICATIONS: TEACHING & LEARNING	Both of the following implications for the teaching and	One of the following implications for the teaching and	Neither of the following implications for the teaching and	No implications for the teaching and learning of students are included.

NCTM Element 7a Gain an in-depth understanding of the mathematical development of students across all of the elementary grades.	learning of students are included: • The reflection identifies the important understandings of student mathematical development and learning that were highlighted as a result of this experience. • The reflection explains the possible implications of student understanding and learning for teaching.	learning of students are included: • The reflection identifies the important understandings of student mathematical development and learning that were highlighted as a result of this experience. The reflection explains the possible implications of student understanding and learning for teaching.	learning of students are included: • The reflection identifies the important understandings of student mathematical development and learning that were highlighted as a result of this experience. • The reflection explains the possible implications of student understanding and learning for teaching.	
IMPLICATIONS: EDUCATIONAL FIELD, STATE & LOCAL **NCTM Element 7b** Develop and use leadership skills to improve mathematics programs at the school and/or district level.	The reflection includes all the following: • An explanation of the implications of the research and results for the educational field • An explanation of the implications of the research and results on the national and state education standards • A discussion of limitations and future research possibilities	The reflection includes two of the following: • An adequate explanation of the implications of the research and results for the educational field • An adequate explanation of the implications of the research and results on the national and state education standards • A discussion of limitations and future research possibilities	The reflection includes one of the following: • An adequate explanation of the implications of the research and results for the educational field • An adequate explanation of the implications of the research and results on the national and state education standards • A discussion of limitations and future research possibilities	No implications for the educational field are included.
COLABORATION: CRITICAL FRIEND COLLABORATION **NCTM Element 7a**	Reflection on the critical friend collaboration includes all of the following:	Reflection on the critical friend collaboration includes three of the following:	Reflection on the critical friend collaboration includes two of the following:	Reflection on the critical friend collaboration includes less than two of the following:

Demonstrate interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others.	• A self-assessment of how the self-study methodological components were addressed using the Five Foci chart • A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching • A description of the mentoring and use of inter-personal skills A discussion of original research questions as a retrospective journey of "self", role, and the conscious (and perhaps at the time unconscious) consequences of actions in the study of teaching practice	• A self-assessment of how the self-study methodological components were addressed using the Five Foci chart • A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching • A description of the mentoring and use of inter-personal skills A discussion of original research questions as a retrospective journey of "self", role, and the conscious (and perhaps at the time unconscious) consequences of actions in the study of teaching practice	• A self-assessment of how the self-study methodological components were addressed using the Five Foci chart • A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching • A description of the mentoring and use of inter-personal skills A discussion of original research questions as a retrospective journey of "self", role, and the conscious (and perhaps at the time unconscious) consequences of actions in the study of teaching practice	• A self-assessment of how the self-study methodological components were addressed using the Five Foci chart • A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching • A description of the mentoring and use of inter-personal skills • A discussion of original research questions as a retrospective journey of "self", role, and the conscious (and perhaps at the time unconscious) consequences of actions in the study of teaching practice
SELF-STUDY PROJECT: FORMATTING				
REFERENCES	The references meet all of the following requirements: • All print and non-print (internet) references are listed. • References and citations meet APA formatting guidelines. • References are current.	The references meet four of the following requirements: • All print and non-print (internet) references are listed. • References and citations meet APA formatting guidelines. • References are current.	The references meet three of the following requirements: • All print and non-print (internet) references are listed. • References and citations meet APA formatting guidelines. • References are current.	The references meet two or fewer of the following requirements: • All print and non-print (internet) references are listed. • References and citations meet APA formatting guidelines. • References are current.

	• References are from varied high-quality sources. All references cited in the research report are included in the list of references.	• References are from varied high-quality sources. All references cited in the research report are included in the list of references.	• References are from varied high-quality sources. All references cited in the research report are included in the list of references.	• References are from varied high-quality sources. • All references cited in the research report are included in the list of references.
REPORT ORGANIZATION	The report organization includes all of the following: • A cover page with title, author's name, and professional affiliation • The report is well-organized, grammatically correct, coherent, and complete. • The report has distinctive focus and voice. • The report uses professional language (i.e., no jargon). • The report is presented in an accessible style. • The report and the appendices meet APA formatting guidelines.	The report organization includes five of the following: • A cover page with title, author's name, and professional affiliation • The report is well-organized, grammatically correct, coherent, and complete. • The report has distinctive focus and voice. • The report uses professional language (i.e., no jargon). • The report is presented in an accessible style. • The report and the appendices meet APA formatting guidelines.	The report organization includes four of the following: • A cover page with title, author's name, and professional affiliation • The report is well-organized, grammatically correct, coherent, and complete. • The report has distinctive focus and voice. • The report uses professional language (i.e., no jargon). • The report is presented in an accessible style. • The report and the appendices meet APA formatting guidelines.	The report organization includes three or fewer of the following: • A cover page with title, author's name, and professional affiliation • The report is well-organized, grammatically correct, coherent, and complete. • The report has distinctive focus and voice. • The report uses professional language (i.e., no jargon). • The report is presented in an accessible style. • The report and the appendices meet APA formatting guidelines.