

**GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
GRADUATE SCHOOL OF EDUCATION
Mathematics Education Leadership**

EDCI 702 DL1: Internship in Mathematics Education
3 Credits, Fall 2015
Mondays 7:20-10:00/Thomson L014 (Face-to-Face & Online)

PROFESSOR:

Name: Dr. Courtney Baker

Office hours: By Appointment

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Dr. Baker will respond to e-mail between 9:00 a.m. and 5:00 p.m. Monday through Friday.

COURSE DESCRIPTION:

A. Prerequisites/Corequisites

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

B. 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.

C. Expanded Course Description

Not applicable.

DELIVERY METHOD:

This course will be delivered both face-to-face and online using both a synchronous and asynchronous format via the Blackboard learning management system (LMS) housed in the MyMason portal. You will log in to the Blackboard course site using your Mason email name (everything before “@masonlive.gmu.edu) and email password. The course site will be available on August 31, 2015.

TECHNICAL REQUIREMENTS:

To participate in this course, students will need the following resources:

- High-speed Internet access with a standard up-to-date browser, either Internet Explorer or Mozilla Firefox. Opera and Safari are not compatible with Blackboard;
- Consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course
- 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 the course requirements.
- The following software plug-ins for Pcs and Macs respectively, available for free downloading by clicking on the link next to each plug-in:
 - Adobe Acrobat Reader: <http://get.adobe.com/reader>
 - Windows Media Player: <http://windows.microsoft.com/en-us/windows/download-windows-media-player>
 - Apple QuickTime Player: <http://www.apple.com/quicktime/download/>
- A headset microphone for use with the Blackboard Collaborate web conferencing tool

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 log-in for all scheduled online synchronous meetings. In addition, students must actively check the course Blackboard site and their GMU email for communications from the instructor, at a minimum this should be 4 times per week.
- **Participation:** Students are expected to actively engage in all course activities throughout the semester, which include viewing of 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 are expected to seek assistance if they are struggling with technical components of the course.
- **Technical Issues:** Students should expect that they could experience some technical difficulties at some point in the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- **Workload:** Expect to log in to this course **at least 3 times a week** to read announcements, participate in the discussions, and work on course materials. Remember, this course is **not** self-paced. There are **specific deadlines** and **due dates** listed in the **CLASS SCHEDULE** section of this syllabus to which you are expected to adhere. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.

- **Advising:** If you would like to schedule a one-on-one meeting to discuss course requirements, content or other course-related issues, and you are unable to come to the Mason campus, we can meet via telephone or web conference. Send me an email to schedule your one-on-one session and include your preferred meeting method and suggested dates/times.
- **Netiquette:** Our goal is to be **collaborative**, not combative. Experience shows that even an innocent remark in the online environment can be misconstrued. I suggest that you always re-read your responses carefully before you post them to encourage others from taking them as personal attacks. **Be positive in your approach to others and diplomatic with your words.** I will do the same. Remember, you are not competing with each other but sharing information and learning from one another as well as from the instructor.

LEARNER OUTCOMES or OBJECTIVES:

This course is designed to enable students to:

- 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)):

A. Standard 6: Professional Knowledge and Skills

- 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.

B. 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*. Thousand Oaks, CA: Sage.

COURSE ASSIGNMENTS AND EXAMINATIONS:

1. Assignment descriptions

a. **Participation (20%)**

Attendance: Attendance at all scheduled online meetings, for the entire class period is a course expectation and absence will impact your grade. Successful completion of this course requires attendance at all meeting and active participation in the discussions. Being on time is also essential and lateness will impact your grade. Please notify instructor ahead of time if you must miss class and work with peers for missed material.

Assignments: Since this is a professional development course, high quality work (i.e., "A" work) is expected on all assignments and in class participation. All assignments must be completed. Assignment 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.ProfessionalDevelopmentPlan.

Readings, Class Activities, and Online Participation: As a distance learning course, there are a significant number of online discussions and activities you will need to complete independently. You are expected to complete all readings and 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. Demonstration of positive and collaborative professional dispositions towards colleagues during peer review, along with a willingness to accept constructive criticism is a course expectation.

Critical Friend Work: As part of your course participation, you will have the opportunity to work with a critical friend(s) to catalogue your research. Your work involves sharing weekly updates in class, sending and corresponding to critical friend research memos, brainstorming ideas as a teacher about the classroom dilemma you are researching and ideas for strategies and lessons, sharing how you are integrating standards in meaningful ways, and peer review of your research report. The 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 your practice. It is *critical* to have friends in research but critical friends are *not critical* in their approach with each other. 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." Specific critical friends 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.

Rubric for Participation				
Category	Exemplary	Accomplished	Developing	Undeveloped
	30 Points	27-29 Points	25-26 Points	Below 25 Points
<i>Attendance/ Participation</i> Attendance and participation are critical components of this course. It gives you the opportunity to learn from and contribute to building a	Outstanding Participation; participates regularly and actively in discussions and activities. Promotes conversation focused on the topic. Comments demonstrate a	Participates in discussions and activities on a regular basis; questions and comments reveal thought and reflection and contribution from assigned readings. Frequently	Doesn't contribute to discussions or activities very often, but generally reveals some thought and reflection and some contribution from assigned readings.	Few meaningful contributions to class discussions. Little evidence of participation and contribution from assigned reading. Shows little concern for peers' learning or input. Misses classes and is late

positive classroom experience and community. Participants contribute to each others' learning in critical friend work by actively listening, exchanging ideas, sharing learning from reading and websites, and supporting each other's efforts	high level of understanding and contribution from assigned readings. Listens actively to peers. Prompts peer feedback and input.	involves peers in discussion.	Follows rather than leads group activities. Solicits some peer discussion. Misses classes. Is late for class.	for class. Does not make up work.
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b. Professional Development Design (30%)

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 any accompanying materials for the professional development (list physical manipulatives), a written reflection paper about the professional development experience (3-5 pages) describing how the goals for the professional development were met, what was learned about teaching teachers, and how the professional development could be modified for future use. You are required to post your Professional Development Project on Blackboard. For a complete rubric and grading criteria please see the rubric at the end of the syllabus.

1. Session Plan (9 Points Possible): The plan should outline the objectives for the session, detail the activities that the teachers will engage in during the session, and provide opportunities for interaction and discussion of the topics. It should be written with enough detail that someone else could implement the session. Similar to a lesson plan for K-12 students, it should also include possible questions the teachers might ask and possible responses. The session should be 1-2 hours.
2. Supplementary Materials (3 Points Possible): Any handouts or other documents (e.g., articles) created for the teachers to take with them or takeaway from the session
3. Reflection Paper (3-5 pages) (6 Points Possible): A narrative including responses to the following

- a. Rationale for the topic (why did you select this topic?)
- b. What did you learn about teaching teachers?
- c. What changes would you make to the session?
- d. What did you learn about teachers' thinking related to your topic?

c. Teacher Research Project Report & Presentation (50%)

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. The final report will be submitted on Blackboard.

In addition to the final report, students will submit assignments throughout the semester that will support the development and implementation of their project: a research proposal and a draft literature review. Finally, students will present their findings in the last class session of the semester.

A. Research Proposal (5 points for on-time submission, see course schedule): Write a research proposal. You may also elect to add a visual representation to your research proposal. The idea is for the visual to help you figure out your "thesis" and not to enter an art show. Approach this assignment from where you are with it and honor its incompleteness as part of the research process. Ask yourself does the written or visual proposal and presentation include or demonstrate:

- **Purpose: A clearly defined focus and purpose**
What is the problem/issue to be addressed?
- **Rationale: Why you chose to explore this research topic and why it matters to others**
What is going on your classroom which brings your attention to this problem/issue? What are your hunches about the reasons for this problem/issue? Why are you interested in this topic and why does it matter to you, your students, and the field?
- **Method and Data Sources:** How do you propose to go about exploring your inquiry? What is your context? Who are your

participants? What are you considering as possible pedagogical strategies? What data sources are you considering that would be available to you?

B. Draft Literature Review (5 points for on-time submission see course schedule): Please post your draft literature review.

- **Consider:**
 - What does the literature review add to your understanding of your research topic?
 - What common topics and themes have you found in the literature?
 - What ideas for pedagogical strategies can you adapt from the literature?

- **Use the topics and themes to design your conceptual framework or mapping of the “big ideas” and connections you find in the literature to your study.**

C. Rubric for Self-Study Teacher Research Project Report (Criteria for Evaluating the Research Report; 70 Points Possible):

Detailed information on the requirements of this assignment are in the rubric provided at the back of this syllabus. You are required to post your Self-Study Teacher Research Project on Blackboard. For a complete rubric and grading criteria please see the rubric at the end of the syllabus.

D. Presentation of Research (20 Points Possible):

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 your practice. You may use bullets, write sentences, incorporate images or charts, and add additional information as needed. Your handout should be created in a Power Point slide that measures 36 inches wide and 24 inches high. To do this click File, Page Set Up, and enter the dimensions. During our final class you will be sharing a handout with each of your classmates. To print a handout that is reasonably sized click Print and then check the box that says Scale To Fit Paper.

Grading Scale for Research Project:

Exemplary: 70 points. Exceeds meeting criteria, multiple sources of evidence that substantially exceeds requirements.

Accomplished: 63-69 points. Provides convincing evidence of sound work, substantially meets requirements.

Developing: 58-62 points. Provides basic and somewhat convincing evidence that moderately meets criteria. Consider revision.

Undeveloped: 57 points and below. No evidence or little evidence of meeting the criteria.

2. Assignment and exam weighting

20%	Participation <ul style="list-style-type: none">• Attendance• Readings, Class Activities and Online Participation• Critical Friend Work• Weekly Researcher Log
30%	Professional Development Design
50%	Self-Study Teacher Researcher Project

All assignments require: American Psychological Association (2010). *Publication Manual of the American Psychological Association*. American Psychological Association: Washington, DC.

3. Grading policies

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%

BLACKBOARD REQUIREMENTS

Every student registered for any Mathematics Education Leadership course with a required performance-based assessment is required to submit this assessment, Professional Development Project Report and Self-Study Teacher research Project Report to Blackboard (regardless of whether a course is an elective, a onetime course or part of an undergraduate minor). Evaluation of the performance-based assessment by the course instructor will also be completed in Blackboard. Failure to submit the assessment to Blackboard will result in the course instructor reporting the

course grade as Incomplete (IN). Unless the IN grade is changed upon completion of the required Blackboard submission, the IN will convert to an F nine weeks into the following semester.

NOTE: This syllabus and schedule has been revised and adapted from the sample syllabus at <http://www.sagepub.com/samaras/resources.htm> created by Anastasia Samaras (2011).

GMU POLICIES AND RESOURCES FOR STUDENTS

- a. Students must adhere to the guidelines of the George Mason University Honor Code (See <http://oai.gmu.edu/the-mason-honor-code/>).
- b. Students must follow the university policy for Responsible Use of Computing (See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- c. Students are responsible for the content of university communications sent to their George Mason University 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.
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (See <http://caps.gmu.edu/>).
- e. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester (See <http://ods.gmu.edu/>).
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (See <http://writingcenter.gmu.edu/>).

ATTENDANCE POLICY

Students are expected to attend the class periods of the courses for which they are registered. In-class participation is important not only to the individual student, but also to the class as a whole. Because class participation may be a factor in grading, instructors may use absence, tardiness, or

early departure as de facto evidence of nonparticipation. Students who miss an exam with an acceptable excuse may be penalized according to the individual instructor's grading policy, as stated in the course syllabus (GMU University Catalog; AP 1.6; See <http://catalog.gmu.edu/content.php?catoid=25&navoid=4845#attendance>).

PROFESSIONAL DISPOSITIONS

Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT

The College of Education & 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/>.

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website <http://gse.gmu.edu/>.

PROPOSED CLASS SCHEDULE:

All readings and assignments are subject to change at the instructor's discretion.

F2F – Face-to-face

Online = Collaborate

DB = Discussion Board/Individual Phone Conferences

	Topic	Self-Study Project Timeline and Assignments Due	Professional Development Project Assignments Due
Week 1 8/31 Interface Online	Introduction To Course Overview of Self-Study Teacher Research Process and Project	Read: Preface, Chapters 1 & 2 SKIM Chapter 12	
Week 2 9/7	Labor Day No Class Meeting	Start noticing your classroom. Brainstorm possible research topics. CFI BLOG POST: CFI 1.1 (p. 5-6)	
Week 3 9/14 Interface Online	Research Question Educational Databases In-Class CFI BLOG POST: CFI 5.1 (p. 96-97) CFI 5.3 (p. 104-105)	CFI BLOG POST: Please <u>post a picture of an artifact (object) or provide a hyperlink</u> to help us learn a little about your research interests. The artifact is a tool to prompt your thinking about your research. Briefly explain your research interests and artifact.	
Week 4 9/21 Interface DB	Research Design In-Class CFI BLOG POST: CFI 4.1 (p. 82) Response to CF	Read: Chapters 5, 6 & 7 BLACKBOARD ASSIGNMENT POST: Research Proposal	BLACKBOARD DB POST: Topics and Goals for PD Session
Week 5 9/28 Interface Online	Research Ethics Research Presentation Anne Driscoll In-Class CFI BLOG POST: CFI 7.1 CF Response	Read: Chapters 8 & 9 BLACKBOARD DB POST: Prepare and post questions for Anne Driscoll.	BLACKBOARD ASSIGNMENT POST: Professional Development Session Plan (DRAFT) *Be ready to share with your CF

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<p>Week 6 10/5</p> <p>Interface Online</p>	<p>Data Collection Class Workshop</p>	<p>Read: Chapters 10 & 11</p> <p>CFI BLOG POST: CFI 8.1</p>	
<p>Week 7 10/13</p> <p>Tuesday Meeting Columbus Day Holiday</p> <p>Interface DB</p>	<p>Data Analysis Class Workshop</p>	<p>Begin Data Collection</p> <p>BLACKBOARD ASSIGNMENT POST: Literature Draft Review Identify Specific Questions/Areas (As Needed)</p>	
<p>Week 8 10/19</p> <p>Interface DB</p>	<p>Validation Class Workshop</p>	<p>Continue Data Collection</p> <p>Begin Analyzing Data</p> <p>CFI BLOG POST: Data Collection Reflection</p>	<p>BLACKBOARD POST & BRING: Final PD Session Plan</p> <p><i>Present PD before Thanksgiving if possible. Consult the instructor if you need to make adjustments.</i></p>
<p>Week 9 10/26</p> <p>Interface F2F</p>	<p>Findings Class Workshop</p> <p>In-Class CFI BLOG POST: CFI 11.1 CF Response</p>	<p>Read Chapter 12</p> <p>Continue Data Collection</p> <p>Continue Analyzing Data</p>	
<p>Week 10 11/2</p> <p>Interface DB</p>	<p>Writing Class Workshop</p> <p>In-Class CFI BLOG POST: CFI 11.2 CF Response</p>	<p>Read One Sample Paper</p> <p>Continue Data Collection</p> <p>Continue Analyzing Data</p>	
<p>Week 11 11/9</p> <p>Interface DB</p>	<p>Critical Friend Workshop</p> <p>In-Class CFI BLOG POST: CFI 11.3 CF Response</p>	<p>Read One Sample Paper</p> <p>Data Analysis</p> <p>Summarize Findings</p> <p>Dialogue About Findings</p>	

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<p>Week 12 11/16</p> <p>Interface Online</p>	<p>Discuss Paper Drafts</p>	<p>Research Paper Draft to CF</p> <p>BLACKBOARD ASSIGNMENT POST: Research Paper Draft to Instructor Identify Specific Questions/Areas (As Needed)</p>	
<p>Week 13 11/23</p> <p>Interface DB</p>	<p>Critical Friend Work</p>	<p>Feedback on Research Paper to CF</p>	
<p>Week 14 11/30</p> <p>Interface DB</p>	<p>Check-In On Writing</p>	<p>Read Chapter 13</p> <p>BLACKBOARD ASSIGNMENT POST: Abstract Draft</p>	<p>BLACKBOARD POST: PD Project Reflection</p>
<p>Week 15 12/7</p> <p>Interface DB</p>	<p>Writing & CF Work</p>	<p>Feedback on Research Paper to CF</p>	
<p>Week 16 12/14</p> <p>Interface F2F</p>	<p>Research Presentation</p> <p>Exit Reflection on Professional Growth and Continued Goals</p>	<p>Bring Copies of Research Flyer</p> <p>BLACKBOARD ASSIGNMENT POST: Research Flyer</p> <p>BLACKBOARD POST: Final Research Paper</p>	

ASSESSMENT RUBRIC(S):

PROFESSIONAL DEVELOPMENT PROJECT RUBRIC

	Satisfactory Performance	Needs Revision	Insufficient	Unsatisfactory Performance
	3	2	1	0
<p>Session Plan (Objectives & Activities)</p> <p>The student demonstrates mathematics-focused instructional leadership through purposefully planning a professional development session that is focused on developing an appropriate classroom or school-level learning environment and involves collaborating with school-based professionals. The plan: 1) outlines the objectives for the session (details the activities the teachers will engage in during the session); and 2) provides opportunities for interaction and discussion of the topics.</p> <p><i>NCTM NCATE Standard 6d</i></p>	<p>1. Plan outlines the objectives for the session, details the activities the teachers will engage in during the session.</p> <p>2. Plan provides opportunities for interaction and discussion of the topics.</p>	<p>Objectives are not clear or lack detail. Opportunities for interaction or discussion are insufficient, limited or superficial.</p>	<p>Significant components of 1 or 2 are missing.</p>	<p>Section missing.</p>
<p>Session Plan (Detailed Writing)</p> <p>The student has planned and developed a mathematics-focused professional development program at the school and/or district level that assists 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. The plan is: 1) written with enough detail that someone else could implement the session; and 2) the organization is logical and clear.</p> <p><i>NCTM NCATE Standard 6c</i></p>	<p>Plan is written with enough detail that someone else could implement the session. Organization is both logical and clear.</p>	<p>Some details in the plan are missing. Components may be difficult to follow or lack logical and/or clear organization.</p>	<p>No details are given. It would be very difficult for someone else to implement the session due to a lack of logical and/or clear organization.</p>	<p>Section missing.</p>

Session Plan (Questions for Teachers)

The students 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 adult learners in a variety of school and professional development settings. The plan includes questions that: 1) are of high cognitive demand (requiring higher-order thinking); 2) include anticipated teacher questions and possible responses; 3) are aligned with the objectives/plan for the session; and 4) are conducive to group/partner discussion.

NCTM NCATE Standard 7a

The plan includes questions that:
 1) are of high cognitive demand (requiring higher-order thinking);
 2) include anticipated teacher questions and possible responses;
 3) are aligned with the objectives/plan for the session;
 and 4) are conducive to group/partner discussion.

One to two of the required elements are not fully developed or one entire element is missing.

Three of the required elements are not fully developed or two entire elements are missing.

Each of the required elements are not fully developed or more than two entire elements are missing.

Supplementary Materials

The student has planned and developed mathematics-focused professional development supplementary materials that will 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. The handouts or other documents (i.e. articles) are: 1) easy to follow/read; 2) error-free; and 3) all included or linked within the plan.

NCTM NCATE Standard 6c

The handouts or other documents (i.e. articles) are: 1) easy to follow/read; 2) error-free; and 3) all included or linked within the plan

One of the required elements is not fully developed or missing.

Two of the required elements are not fully developed or missing.

All of the required elements are not fully developed or missing.

Reflection Paper (Rationale & Teaching Teachers)

The student has developed themselves as a reflective practitioner by reflecting on the experience of engaging in and facilitating a professional development session that enhances learning opportunities for all students' and/or teachers' mathematical knowledge development and involves colleagues and other school professionals. A rationale that discusses teaching teachers is included that addresses the following elements: 1) a detailed rationale for the chosen topic that is connected to the student's practice; and 2) at least three lessons learned about teaching teachers from the planning and leading of the professional development session.

NCTM NCATE Standard 6b

A rationale that discusses teaching teachers is included that addresses the following elements: 1) a detailed rationale for the chosen topic that is connected to the student's practice; and 2) at least three lessons learned about teaching teachers from the planning and leading of the professional development session.

The rationale is not detailed or is disconnected from teachers' practice. Reflection about learning related to teaching teachers is not sufficiently discussed/explained. Reflection may not be connected to the session. Fewer than three items are included or are too general.

Rationale is not included or supported. Learning about teaching teachers is not included or is superficial/generic.

Section missing.

Reflection Paper (Changes and Implications)

The student has reflected on the implementation of the professional development field experience by identifying the leadership skills required to improve mathematics programs at the school and/or district level and the creation of a shared vision for school improvement by partnering with school-based professionals to improve student achievement. The reflection includes: 1) at least three changes that would be made to the session; 2) the knowledge gained about teachers' thinking related to the topic.

NCTM NCATE Standard 7b

The reflection includes: 1) at least three changes that would be made to the session that are connected to the reflection on the session and clearly explained; and 2) the knowledge gained about teachers' thinking related to the topic with supporting evidence or examples from the session.

Changes are not connected to reflection about the session or not clearly explained. Learning about teachers' thinking related to the topic is not supported with evidence or examples from the session.

Evidence is not given to support changes or reflections about teachers' thinking in the session.

Section missing.

SELF-STUDY TEACHER RESEARCH PROJECT RUBRIC

	Satisfactory Performance value: 5.00	Needs Revision value: 3.00	Insufficient value: 1.00	Unsatisfactory Performance value: 0.00
Abstract	1. Have you provided a single, articulate, concise paragraph of no more than 150 words 2. Does your abstract concisely describe your purpose, context, method, key findings, and significance?	Abstract is sufficiently describes the purpose, context, methods, key findings and significance but may be too long or too short.	Missing responses to some items in questions 1 or 2.	No abstract included
Rationale A rationale is provided for the student's self-study that involves the development of a broad experiential base of knowledge and skills working with a range of student and/or adult learners in a school/professional development setting. <i>NCTM NCATE Standard 7a</i>	1. Have you clearly and concisely explained why this research is important to you? Have you offered perspectives that shaped this question for you? 2. Did you provide a rationale for why this research is important to your students/teachers/participants? 3. Have you addressed the broader educational and social significance of this research?	Rationale may be concise but lacks some detail regarding self or students/teachers who are participants in the study. Description of broader educational significance is not addressed sufficiently for the study.	Missing responses to questions 1, 2 or 3	No rationale included
Research Problem/Questions A research problem and questions are identified that address the development and use of leadership skills to improve mathematics programs. <i>NCTM NCATE Standard 7b</i>	1. Have you clearly and concisely stated the research problem? 2. Have you clearly and concisely stated your main research question and any sub questions?	Research problem may be unclear or unfocused.	Missing responses to items in questions 1 or 2.	No research problem or question description included.

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<p>Review of the Literature</p> <p>A review of research-based literature is provided for the student's self-study that involves the development of a broad experiential base of knowledge and skills working with a range of student and/or adult learners in a school/professional development setting.</p> <p><i>NCTM NCATE Standard 7a</i></p>	<p>1. Did you conduct an ongoing literature review which informed your research? 2. Is the review relevant and connected to your study? 3. Is the review adequate, coherent, and analytical? 4. Does the review include references from a variety of sources?</p>	<p>Literature review needs more details about connections to study and relevance to the research problem. References are insufficient. References may not be cited for all sources.</p>	<p>Missing responses to items 1, 2, 3 or 4.</p>	<p>Not included</p>
<p>Conceptual Framework</p> <p>A conceptual framework is provided for the student's self-study that involves the development of a broad experiential base of knowledge and skills working with a range of student and/or adult learners in a school/professional development setting.</p> <p><i>NCTM NCATE Standard 7a</i></p>	<p>1. Is the review integrated into a conceptual framework with a mapping of the theories, literature, and phenomena that help to inform your study?</p>	<p>Conceptual framework is missing theory, literature or information about the phenomenon under investigation. Conceptual framework does not reflect the scope of the study.</p>	<p>Mapping is superficial or lacks details.</p>	<p>Not included</p>

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<p>Research Method (Context/Participants)</p> <p>A research method is identified that addresses the development and use of leadership skills to improve mathematics programs within a specific context.</p> <p><i>NCTM NCATE Standard 7b</i></p>	<p>1. Have you described your research context; community, school, and classroom context, and demographic information of participants?</p>	<p>Some minor details about context or participants are missing.</p>	<p>Missing significant details or information about the participants or context.</p>	<p>Not included</p>
<p>Research Method (Self-Study and Reflection)</p> <p>A rationale for the identified research method is identified that addresses the development and use of leadership skills to improve mathematics programs within a specific context.</p> <p><i>NCTM NCATE Standard 7b</i></p>	<p>1. Did you explain which self-study method you chose and why? 2. Did you include your reflection of the problem? e.g., observations, possible causes? 3. Have you explained the reasons for your pedagogies based on your noticing of your classroom and the literature reviewed?</p>	<p>Reflection on the problem lacks detail regarding foundations of the study. Reflection may also lack information about connections between pedagogies/interventions and the literature.</p>	<p>Missing significant components of 1, 2 or 3.</p>	<p>Not included</p>

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<p>Research Method (Data Collection)</p> <p>Data is collected that addresses the development and use of leadership skills to improve mathematics programs within a specific context.</p> <p><i>NCTM NCATE Standard 7b</i></p>	<p>1. Have you described in detail what data you collected, how you collected it, and when you collected it, including data generated from your pedagogies and strategies? 2. Does your data include a variety of sources from multiple sources? 3. Did you include a timeline for the data you collected and your planned interventions? 4. Did you explain how you analyzed your data and include a complete data audit trail? 5. Have you included and explained the role of your critical friends in your data interpretations? 6. Did you explore using visuals and technologies for analyzing and displaying your findings in a coherent manner?</p>	<p>Data collection plan is missing details about process or data collected. Data collection may also not be well-connected to research problem or lacks sufficient variety in sources. Timeline may lack detail or be inconclusive. Visuals do not clearly represent the data.</p>	<p>Missing significant components from 1, 2, 3, 4, 5, or 6.</p>	<p>Not included</p>
<p>Findings (Presentation)</p> <p>Findings are thoroughly and adequately provided for the student's self-study that involves the development of a broad experiential base of knowledge and skills working with a range of student and/or adult learners in a school/professional development setting.</p> <p><i>NCTM NCATE Standard 7a</i></p>	<p>1. Did you circle back to your research question(s) and discuss how they relate your findings? 2. Are the findings thoroughly and adequately presented?</p>	<p>Findings are presented but do not circle back to the research question sufficiently. Some details may be missing about findings or data is presented superficially.</p>	<p>Missing responses to items in questions 1 or 2.</p>	<p>Not included</p>

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<p>Findings (Evidence & Support)</p> <p>Findings are convincing and connected to the themes provided for in the student's self-study that involves the development of a broad experiential base of knowledge and skills working with a range of student and/or adult learners in a school/professional development setting.</p> <p><i>NCTM NCATE Standard 7a</i></p>	<p>1. Is there convincing evidence to support your themes? 2. Is there connection and coherence among the separate themes? 3. Did you share your findings with your critical friend?</p>	<p>Themes are presented but lack sufficient evidence to support them. There is a lack of connection or explanation of coherence among the themes.</p>	<p>Missing significant components of 1, 2 or 3.</p>	<p>Not included</p>
<p>Discussion, Self-Study of Teaching & Implications (Teaching & Learning, Local)</p> <p>A discussion of the self-study research and possible implications are identified for mathematics programs at the local, school, and/or district level in order to better develop an action plan for teaching and learning of mathematics (i.e. school improvement, teacher improvement).</p> <p><i>NCTM NCATE Standard 7b</i></p>	<p>1. Have you explained the possible implications to your students' learning? 2. Have you explained the possible implications of to your understanding of teaching? 3. Have you offered a self-assessment of how you addressed the self-study methodological components using the Five Foci chart? 4. Have you discussed how you reshaped your practice from critical friend feedback? 5. Does your discussion include evidence of your deep reflection and self-study of teaching? 6. Revisit your original research questions. Take a retrospective journey and reflect back on the "self" or your role and the conscious (and perhaps at the time unconscious) consequences of your actions in the process of studying your teaching practice.</p>	<p>Some implications for teachers or students may be missing or insufficiently addressed. Some aspects of self-assessment or reflection about research questions may be missing. Retrospective may lack detail or is superficial. Your actions in the self-study may not be reflected upon.</p>	<p>Missing significant components of 1, 2, 3, 4, 5 or 6.</p>	<p>Not included.</p>

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<p>Discussion, Self-Study of Teaching & Implications (Education Field, State/National)</p> <p>A discussion of the self-study research and possible implications are identified for mathematics programs at the state and/or national level in order to better develop policy for the teaching and learning of mathematics (i.e. school improvement, teacher improvement).</p> <p><i>NCTM NCATE Standard 7b</i></p>	<p>1. Have you adequately explained the possible implications to the education field? 2. Have you adequately explained the possible implications of your study to national and state education standards? 3. Have you discussed any limitations and identified future research possibilities?</p>	<p>Implications are not thoroughly or adequately explained. Implications may be disconnected from the findings or the data analyzed. Limitations not thoroughly discussed or lack detail.</p>	<p>Missing significant components of 1, 2 or 3.</p>	<p>Not included</p>
<p>References and Appendix</p>	<p>1. Did you follow the APA style for the report, references, citations, and appendix? 2. Are references current and from different and high quality sources? 3. Have you provided a complete list of all print and non-print (internet) references? 4. Are all references cited in the research report included in the references?</p>	<p>APA style not consistently followed for references and citations. Quality of references may be lacking. Reference list may be incomplete.</p>	<p>Missing significant components of 1, 2, 3 or 4.</p>	<p>Not included</p>
<p>Organization</p>	<p>1. Does the report include a cover page, title, author's name and professional affiliation? 2. Is your report well organized, grammatically correct, coherent and complete? 3. Does the report have your distinctive focus and voice? Have you used professional language? (i.e., no jargon) Have you written in an accessible style and presentation?</p>	<p>Report may lack professional language or organization in some areas. Report may have minor grammatical or style errors.</p>	<p>Report is disorganized, incomplete, unprofessional or contains significant grammatical/style errors throughout.</p>	<p>Not included</p>