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

EDCI 702.DL1 – Internship in Mathematics Education 3 Credits, Spring 2020 Thursdays/4:30 - 7:10p.m. Online Synchronous & Asynchronous

Faculty

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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 August 26, 2019.

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-devicesand-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: <u>https://get.adobe.com/reader/</u>
 - Windows Media Player:

https://support.microsoft.com/en-us/help/14209/get-windows-media-player

• Apple Quick Time Player: <u>www.apple.com/quicktime/download/</u>

Expectations

- <u>Course Week:</u> 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.

• <u>Participation:</u>

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.

• <u>Technical Competence:</u>

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.

• <u>Technical Issues:</u>

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.

• <u>Workload:</u>

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.

• <u>Netiquette:</u>

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

This course is designed to enable students to do the following:

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 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 schoolbased 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.

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

<u>Attendance</u>

- 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/ | Participates regularly | Participates | Participates | Does not participate |
| Participation | and substantively in | regularly in | occasionally in | in discussions and |
| | discussions and | discussions and | discussions and | activities |
| Attendance and | activities | activities | activities | |
| participation are | | | | Offers little or no |
| critical components | Promotes | Demonstrates | Reveals some | evidence of |
| of this course. | conversation focused | purposeful reflection | thoughts on assigned | reflection on |
| Participation | on the topic | on assigned readings | readings through | assigned readings |
| creates | | through verbal | verbal contributions | |
| opportunities to | Demonstrates a high | contributions | | Shows little concern |
| learn from one | level of understanding | | Follows rather than | for peers' learning or |
| another and to | of assigned readings | Frequently involves | leads group | input. |
| build a positive | through verbal | peers in discussion | activities. | |
| classroom | contributions | | a. 11. 1. | Misses classes and is |
| experience and | | | Solicits some peer | late for class |
| community. | Prompts peer | | discussion | |
| Participants | feedback and input | | | Does not make up |
| contribute to | T 1 1 1 | | Misses classes or is | work |
| others' learning in | Listens actively to | | late for class | |
| critical friend work | peers | | | |
| by actively | | | | |
| listening, | | | | |
| exchanging ideas, | | | | |
| sharing learning | | | | |
| from reading and | | | | |
| websites, and | | | | |
| supporting each | | | | |
| other's efforts. | | | | |

• Professional Development Design (30%)

• 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.

• Teacher Research Project Report & Presentation (50%)

- 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.
- 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 literature review. 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 (2010). *Publication Manual of the American Psychological Association*. American Psychological Association: Washington, DC.

• 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

• 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:

| А | 93%-100% | $\mathbf{B}+$ | 87%-89% | С | 70%-79% |
|----|----------|---------------|---------|---|-----------|
| A- | 90%-92% | В | 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/

Class Schedule

| | Торіс | Self-Study Project Timeline and Assignments Due | Professional Development Project Assignments Due |
|--|--|--|--|
| Week 1 1/23 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 1/30 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 2/6 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 2/13 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 2/20 Format Asynchronous | Research EthicsIn-Class BLACKBOARDASSIGNMENT POST:Research ProposalProfessional DevelopmentProject CollaborationIn-Class CFI BLOGPOST:CFI 7.1CF Response | Read: Chapters 8 & 9 Gather Literature | Be ready to share your Professional Development Session Plan FULL DRAFT with CF in class. |
| Week 6 2/27 | Professional Development Project Collaboration | Read: Chapters 10 & 11 | BLACKBOARD ASSIGNMENT POST: |

| Format | Data Collection | Gather Literature | Professional Development Session Plan Due for |
|---|---|---|---|
| Synchronous | Brainstorm & Identification | CFI BLOG POST: CFI 8.1 | Instructor Feedback |
| | Review & Update CFI 8.1 | | |
| Week 7 3/5 | Data Collection Workshop | Begin Data Collection | |
| 575 | CFI BLOG POST: | Finalize & Reflect on CFI 8.1 | |
| Format Asynchronous | CF Response | | |
| Week 8 3/12 | Literature Review Workshop | Continue Data Collection | |
| Format | BLOG POST: | BLACKBOARD ASSIGNMENT POST: | |
| Asynchronous | Data Collection Reflection | Literature Review Due | |
| & Blackboard Collaborate Consults | | Identify Specific Questions/Areas (As Needed) | |
| | Data Collection Workshop | Read Chapter 9 | Bring Problem of Practice & Peer Access to Data |
| | Problems of Practice | Continue Data Collection & Analysis | Peer Access to Data |
| Week 9 | | | BLACKBOARD POST & |
| 3/19 Format | Class Analysis of Data | BLOG POST: CF Response to Data Collection Reflection | BRING: Update on PD Session Plan |
| Synchronous | | | Present PD before Week 12 if possible. Consult the instructor if you need to adjust. |
| | Writing Class Workshop | Read One Sample Paper | |
| Week 10 3/26 | In-Class CFI BLOG POST: | Continue Data Collection | |
| Format Asynchronous | CF Response 9.1 | Continue Analyzing Data | |
| | Data Collection Workshop | Read Chapter 11 | Bring Problem of Practice & Peer Access to Data |
| | Problems of Practice | Read One Sample Paper | Peer Access to Data |
| Week 11 4/2 | Class Analysis of Data | Data Analysis | |
| Format | Critical Friend Workshop | Summarize Findings | |
| Synchronous | In-Class CFI BLOG POST: CF Response CFI 11.1 | Dialogue About Findings | |
| | | | |
| Week 12 4/9 | Data Collection Workshop | Research Paper Draft to CF | Bring Problem of Practice & Peer Access to Data |

| Format Asynchronous | Class Analysis of Data Discuss Paper Drafts CFI 11.2 Collaborate Instructor Consults | BLACKBOARD ASSIGNMENT POST: Research Paper Draft to Instructor Identify Specific Questions/Areas (As Needed) | |
|---|--|---|---|
| Week 13 4/16 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 4/23 Format Asynchronous | Critical Friend Work Optional Collaborate Instructor Consults | Read Chapter 13 | |
| Week 15 4/30 Format Synchronous | Research Presentation Exit Reflection on Professional Growth and Continued Goals | Prepare Electronic Copies of Research Flyer in ClassBLACKBOARD ASSIGNMENT POST: Research FlyerBLACKBOARD 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: <u>http://cehd.gmu.edu/values/</u>.

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 http://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 <u>tk20help@gmu.edu</u> or <u>https://cehd.gmu.edu/aero/tk20</u>. Questions or concerns regarding use of Blackboard should be directed to <u>http://coursessupport.gmu.edu/</u>.
- For information on student support resources on campus, see <u>https://ctfe.gmu.edu/teaching/student-support-resources-on-campus</u>

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.

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

| 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. | experience will impact student learning. | impact student learning. | 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 D SESSION PLAN NCTM Standard 7b | EVELOPMENT EXPENT The plan includes sufficient detail for someone else to implement the session. | The plan includes sufficient detail for someone else to implement the session. | Some details necessary for implementation of the plan are missing. | No details for implementation of the plan are given. |

| leadership skills to improve mathematics programs at the school and/or district level, e.g., coaching/mentorin g new and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics education; communicating to education; and/or clear organization. Some components of the plan may be difficult to follow OR lack logical and/or clear organization. OR lack logical and/or clear organization. OR lack logical and/or clear organization. OR jack logical and/or clear OR j | Develop and use | | | | It would be very |
|---|-----------------------|------------------|---------------------|---------------------|----------------------------------|
| improve mathematics programs at the school and/or district tevel, e.g., coaching/mentoring gnew and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teachers to botter serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teachers to local, aster, or national policy decisions related to mathematics teachers about students, constituents about student's achievement.of the plan may be difficult to follow or anization.components of the plan may be difficult to follow or ganization.someone else to improve ach student's achievement.COACHING d dThe professional development providescomponents of the professional development providescomponents of the professional development providesThe professional development development provides mathematics- focusedThe professional development provides mathemat | leadership skills to | The organization | Some | Some | |
| both logical AND clear. both logical AND clear. CR lack logical and/or clear and/or clear organization. CR lack logical and/or clear organization. | improve | - | | | |
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| actions such as | the following | the following | the following | relationships |
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| coaching | actions: | actions: | actions: | with teachers, |
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| building and | coaching | coaching | coaching | administrators, |
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| relationships with | building and | | building and | community |
| teachers, | - | building and | - | establishing and |
| administrators, and | navigating | navigating | navigating | maintaining |
| the community; | relationships | relationships | relationships | learning |
| establishing and | with teachers, | with teachers, | with teachers, | - |
| maintaining | administrators, | administrators, | administrators, | communities |
| learning | and the | and the | and the | analyzing and |
| communities; | community | community | community | evaluating |
| analyzing and | establishing and | establishing and | establishing and | educational |
| evaluating | - | - | - | structures and |
| educational | maintaining | maintaining | maintaining | policies that |
| structures and | learning | learning | learning | affect students' |
| policies that affect | communities | communities | communities | |
| students' equitable | analyzing and | analyzing and | analyzing and | equitable access |
| access to high | evaluating | evaluating | evaluating | to high quality |
| quality mathematics | educational | educational | educational | mathematics |
| | structures and | structures and | structures and | instruction |
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| that all students | policies that | policies that | policies that | to assure that all |
| have opportunities | affect students' | affect students' | affect students' | students have |
| to learn important | equitable access | equitable access | equitable access | opportunities to |
| mathematics; | to high quality | to high quality | to high quality | |
| evaluating the | mathematics | mathematics | mathematics | learn important |
| alignment of | instruction | instruction | instruction | mathematics |
| mathematics | leading efforts | leading efforts | leading efforts | evaluating the |
| curriculum | to assure that all | to assure that all | to assure that all | alignment of |
| standards, | | | | mathematics |
| textbooks, and | students have | students have | students have | curriculum |
| required | opportunities to | opportunities to | opportunities to | standards, |
| assessments and | learn important | learn important | learn important | textbooks, and |
| making | mathematics | mathematics | mathematics | |
| recommendations | evaluating the | evaluating the | evaluating the | required |
| for addressing | alignment of | alignment of | alignment of | assessments and |
| learning and | mathematics | mathematics | mathematics | making |
| achievement gaps; | curriculum | curriculum | curriculum | recommendatio |
| developing appropriate | | | | ns for addressing |
| classroom or | standards, | standards, | standards, | learning and |
| school-level | textbooks, and | textbooks, and | textbooks, and | achievement |
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| environments; and | assessments and | assessments and | assessments and | gaps |
| collaborating with | making | making | making | developing |
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| professionals to | ns for addressing | ns for addressing | ns for addressing | classroom or |
| develop evidence- | learning and | learning and | learning and | school-level |
| based interventions | - | - | - | learning |
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| achieving students. | gaps | gaps | 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. | 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. | 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. | 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 substantive opportunities for interaction and discussion of the topics. | 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 interaction and discussion of the topics. | 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. |

| RESOURCES & SUPPLEMENTAR Y 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 involves the development of a broad experiential base of knowledge and skills working with a range of student and adult | The professional development plan takes into consideration adult and student learners. Specific considerations for adult learners AND student learners are articulated in the professional development plan. | 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 development plan. | 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 development plan. | The professional development plan does not take into consideration adult and student learners. |

| 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. 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 |
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| planned field | teacher | teacher | teacher | teacher |
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| experienced and | framed positively | framed positively | not framed | |
| highly qualified mathematics | and highlight the | but do highlight | positively and do | |
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| mentoring other | development. | development. | the professional | |
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| personnel, district | | | | |
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| ASSESSMENT | The professional | The professional | The professional | The professional |
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| themselves and | newly acquired | newly acquired | newly acquired | |
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| highly qualified | 2. Modify the plan | is provided | is provided | collaboration |
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| settings and the development of | plan in a school | 4.Implement the | 4.Implement the | advance of |
| interpersonal skills | or district setting. | plan in a school | plan in a school | implementation |
| critical for | 5.Reflect deeply | or district setting. | or district setting. | 4.Implement the |
| mentoring other | after | 5.Reflect deeply | 5.Reflect deeply | plan in a school |
| teachers and | implementation | after | after | or district setting. |
| working with | of the plan. | | implementation | - |
| school-based | of the plan. | implementation | • | 5.Reflect deeply |
| personnel, district | | of the plan. | of the plan. | after |
| administrators, and | | | | implementation |
| others. | | | | of the plan. |
| | | | | |
| PROFESSIONAL D | EVELOPMENT EXPE | RIENCE: REFLECTION | J | |
| THE ROLE OF | The reflection | The reflection | The reflection | The reflection |
| LEARNING & | clearly identifies | identifies how | identifies that | does not |
| TEACHING OF | how the | the professional | the professional | mention the |
| MATHEMATICS | professional | development | development | candidate's |
| | development | experience is | experience is | personal |
| NCTM Standard | • | • | directly related | • |
| 6a | experience | directly related | | teaching or |
| Take an active role | directly related | to the learning | to their learning | learning of |
| in their professional | to the learning | and teaching of | and teaching of | mathematics. |
| growth by | and teaching of | mathematics. | mathematics. | |
| participating in | mathematics. | | | |
| professional | | The reflection | The explanation | |
| development | The reflection | clearly describes | of the | |
| experiences that | clearly describes | the impact of the | professional | |
| directly relate to | | | P. Creccional | |

| the learning and teaching of mathematics. | the impact of the professional development experience on the candidate's personal learning and teaching of mathematics. | professional development experience on either the candidate's personal learning and or the candidate's personal teaching of mathematics. | development experience is not connected to the candidate's personal teaching and 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 UNDERSTANDIN G 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 reflection identifies two important understandings of elementary student mathematical development that were highlighted as a result of this professional development experience. | The reflection identifies one important understanding of elementary student mathematical development that was highlighted as a result of this professional development experience. | The reflection identifies one understanding of elementary student mathematical development. The understanding was not connected to the professional development experience. | The reflection does not identify any important understandings of elementary student mathematical development that were highlighted as a result of this professional development experience. |

| educator that involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners. | | | | |
|---|--|---|---|--|
| CONTINUING | The reflection | The reflection | The reflection | The reflection |
| IMPLEMENTATIO | describes the | describes the | describes the | does not |
| Ν | next steps that | next steps that | next steps that | describe the next |
| NCTM Standard 7b Develop and use leadership skills to improve mathematics programs at the school or district | the candidate would take as a mathematics instructional leader implementing the identified action. | the candidate would take as a mathematics instructional leader implementing the identified action. | the candidate would take as a mathematics instructional leader implementing the identified action. | steps that the candidate would take as a mathematics instructional leader implementing the identified |
| level, e.g. collaborating to create a shared vision and to develop an action plan for school improvement. | The next steps clearly articulate a plan to meet colleagues' needs with a timeline for implementation. | The next steps of include either a plan to meet colleagues' needs or a timeline for implementation. | The next steps of implementation do not include a plan to meet colleagues' needs nor a timeline for implementation. | 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-S | Study Project Rubri | c (Course Performa | ance-Based Assessn | nent) |
|----------------------|---------------------------------------|---------------------------------------|---------------------------------------|----------------------|
| Level/Criteria | 4 | 3 | 2 | 1 |
| | Exceeds | Meets | Developing | Does Not Meet |
| | Expectations | Expectations | | Expectations |
| SELF-STUDY PROJECT | : FIELD EXPERIENCE SE | QUENCE | | |
| SEQUENCE OF | The candidate uses | The candidate uses | The candidate uses | The candidate uses |
| PLANNED FIELD | each of the steps in | four of the steps in | three of the steps in | fewer than three |
| EXPERIENCE | the following | the following | the following | steps in the |
| | sequence to | sequence to | sequence to | following sequence |
| NCTM Standard 7a | develop, implement | develop, implement | develop, implement | to develop, |
| | and reflect on the | and reflect on the | and reflect on the | implement and |
| Engage in a | self-study project: | self-study project: | self-study project: | reflect on the self- |
| sequence of | 1. Develop planned | 1. Develop planned | 1. Develop planned | study project: |
| planned field | field experience | field experience | field experience | 1. Develop planned |
| experiences and | with peer | with peer | with peer | field experience |
| clinical practice in | collaboration | collaboration | collaboration | with peer |
| an elementary | where feedback | where feedback is | where feedback is | collaboration |
| setting and are | is provided by a | provided by a | provided by a | where feedback |
| supervised by an | critical friend | critical friend | critical friend | is provided by a |
| experienced and | 2. Modify planned | 2. Modify planned | 2. Modify planned | critical friend |
| highly qualified | field experience | field experience | field experience | 2. Modify planned |
| mathematics | based upon peer | based upon peer | based upon peer | field experience |
| educator. | feedback | feedback | feedback | based upon peer |
| | 3. Frequently | 3. Frequently | 3. Frequently | feedback |
| | submit plan to an | submit plan to an | submit plan to an | 3. Frequently |
| | experienced and | experienced and | experienced and | submit plan to an |
| | highly qualified | highly qualified | highly qualified | experienced and |
| | mathematics | mathematics | mathematics | highly qualified |
| | educator for | educator for | educator for | mathematics |
| | | | | educator for |
| | individualized | individualized | individualized | individualized |
| | feedback | feedback | feedback | |
| | 4. Implement | 4. Implement | 4. Implement | feedback |
| | planned field | planned field | planned field | 4. Implement |
| | experience in a | experience in a | experience in a | planned field |
| | school or district | school or district | school or district | experience in a |
| | setting | setting | setting | school or district |
| | | | | setting |
| | Poflact doonly unar | Poflact doonly unar | Poflact doonly unar | |
| | Reflect deeply upon experience during | Reflect deeply upon experience during | Reflect deeply upon experience during | Reflect deeply upon |
| | and after | and after | and after | experience during |
| | implementation | implementation | implementation | and after |
| | | | | implementation |
| | | | | |
| SELF-STUDY PROJECT | : RESEARCH REPORT | | l | |
| ABSTRACT | The abstract has all | The abstract has | The abstract has | No abstract is |
| - | of the following | two of the following | one of the following | included or the |
| | characteristics: | characteristics: | characteristics: | 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 | One paragraph with no more than 150 words Clear and concise word choice A description of the purpose, context, method, key findings, and significance | One paragraph with no more than 150 words Clear and concise word choice A description of the purpose, context, method, key findings, and significance | One paragraph with no more than 150 words 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 | A rationale is included that provides all of the following: • Clearly and concisely explains the personal importance of this research | A rationale is included that provides four of the following: • Clearly and concisely explains the personal importance of this research | A rationale is included that provides three of the following: • Clearly and concisely explains the personal importance of this research | A rationale is included that provides two or fewer of the following: • Clearly and concisely explains the personal importance of this research |
| professional development settings. | • 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 teachers in the school or district setting. | • 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 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. | • Clearly and concisely explains the importance of this research to the students in the school or district setting. | • Clearly and concisely explains the importance of this research to the students 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 | Provides perspectives that have shaped the research question | Provides perspectives that have shaped the research question | Provides perspectives that have shaped the research question |
| | Addresses the broader educational and social | Addresses the broader educational and social | Addresses the broader educational and social | Addresses the broader educational and social |

| | significance of the research | significance of the research | significance of the research | significance of the research |
|---------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| RESEARCH | The paper includes | The paper includes | The paper includes | The paper includes |
| PROBLEM & | all of the following: | three of the | two of the | fewer than two of |
| QUESTIONS | an of the following. | following: | following: | the following: |
| QUESTIONS | • The research | TOHOWINg. | TOHOWINg. | the following. |
| NCTM Standard 7b | problem and | • The research | • The research | • The research |
| | questions are | problem and | problem and | problem and |
| Develop and use | connected to | questions are | questions are | questions are |
| leadership skills to | improving | connected to | connected to | connected to |
| improve | mathematics | improving | improving | improving |
| mathematics | | mathematics | mathematics | mathematics |
| programs at the | programs at the | | | |
| school and/or | school and/or | programs at the | programs at the | programs at the |
| district level, e.g., | district level. | school and/or | school and/or | school and/or |
| coaching/mentoring | | district level. | district level. | district level. |
| new and | • The research | | | |
| experienced | problem is clearly | • The research | • The research | • The research |
| teachers to better | and concisely | problem is clearly | problem is clearly | problem is clearly |
| serve students; | stated. | and concisely | and concisely | and concisely |
| sharing critical | שמובט. | stated. | stated. | stated. |
| issues, policy | | | Stateu. | stateu. |
| initiatives, and | • The main research | | | |
| curriculum trends | question is clearly | • The main research | • The main research | • The main research |
| related to | and concisely | question is clearly | question is clearly | question is clearly |
| mathematics | stated. | and concisely | and concisely | and concisely |
| teaching; keeping | Stated. | stated. | stated. | stated. |
| abreast of local, | | stated. | stated. | stated. |
| state, or national | The sub research | | | |
| policy decisions | questions (if | The sub research | The sub research | The sub research |
| related to | applicable) are | questions (if | questions (if | questions (if |
| mathematics | clearly and | applicable) are | applicable) are | applicable) are |
| education; | concisely stated. | clearly and | clearly and | clearly and |
| communicating to educational | | concisely stated. | concisely stated. | concisely stated. |
| 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. | | | | |
| REVIEW OF THE | The literature | The literature | The literature | The literature |
| | | | | |

| NCTM Standard 7a | of the following | of the following | of the following | include the |
|---|--|---|---|--|
| NCTIVI Standard 78 | of the following elements: | of the following elements: | of the following elements: | following elements: |
| Develop a broad experiential base of knowledge and skills working with a range of student | It is connected to the research study. | It is connected to the research study. | It is connected to the research study. | It is connected to the research study. |
| and adult learners in varied school and professional development settings. | It is adequate, coherent and analytical. | It is adequate, coherent and analytical. | It is adequate, coherent and analytical. | It is adequate, coherent and analytical. |
| | 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 | The candidate connects and explains theories, | The candidate connects and explains theories, | The candidate does not connect and explain theories, | No conceptual framework is included. |
| NCTM Standard 7a | literature, and phenomena in a | literature, and phenomena in a | literature, and phenomena in a | |
| Demonstrate a broad experiential base of knowledge and skills working with a range of student and adult learners in varied school and professional development | way that informs the research study AND integrates the literature review into the conceptual framework. | way that informs the research study OR integrates the literature review into the conceptual framework. | way that informs the research study AND does not integrate the literature review into the conceptual framework. | |
| settings. | | | | |
| RESEARCH METHOD: CONTEXT | The research method includes all | The research method includes | The research method includes | The research method includes |
| & PARTICIPANTS | of the following: | two of the following: | one of the following: | none of the following: |
| NCTM Standard 7b | A description of the overall | • A description of | • A | • A description of |
| Participate and encourage teachers to participate in innovative or | research contextA description of | the overall research context | description of the overall research context. | the overall research context |
| transformative initiatives, partnerships, or research projects related to the teaching of elementary mathematics. | the specific community, school, and classroom context Demographic information for the participants | A description of the specific community, school and classroom context Demographic information on the | • A description of the specific community, school and classroom context. | A description of the specific community, school and classroom context Demographic |
| | participanto | participants. | | information on the participants |

| | | | D | را |
|-----------------------|--|--|--|--|
| | | | Demographic | |
| | | | information on the | |
| | | | participants. | |
| RESEARCH | The research | The research | The research | The research |
| METHOD: SELF- | method includes all | method includes | method includes | method includes |
| STUDY & | of the following: | two of the | one of the | none of the |
| REFLECTION | | following: | following: | following: |
| | A reflection on | | | |
| NCTM Standard 7b | the problem (e.g. | A reflection on | • A reflection on the | • A reflection on |
| | observations, | the problem (e.g. | problem (e.g. | the problem (e.g. |
| Develop and use | possible causes, | observations, | observations, | observations, |
| leadership skills to | etc.) | possible causes, | possible causes, | possible causes, |
| improve | | etc.) | etc.) | etc.) |
| mathematics | | | | |
| programs at the | An explanation for | | | |
| school and/or | the chosen | An explanation for | • An explanation for | An explanation for |
| district level, e.g., | pedagogies based | the chosen | the chosen | the chosen |
| coaching/mentoring | on the noticing of | pedagogies based | pedagogies based | pedagogies based |
| new and | the environment | on the noticing of | on the noticing of | on the noticing of |
| experienced | | the environment | the environment | the environment |
| teachers to better | | | | |
| serve students; | An explanation for | | | |
| sharing critical | the chosen | An explanation for | An explanation for | An explanation for |
| issues, policy | pedagogies based | the chosen | the chosen | the chosen |
| initiatives, and | on the literature | pedagogies based | pedagogies based | pedagogies based |
| curriculum trends | reviewed | on the literature | on the literature | on the literature |
| related to | | reviewed | reviewed | reviewed |
| 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. | | | | |
| | | | | |

| | All of the following | At loast three of the | At loost two of the | Loca than two of the |
|--|---|---|---|---|
| DATA COLLECTION NCTM Standard 5c | All of the following are included in the data collection: | At least three of the following are included in the data collection: | At least two of the following are included in the data collection: | Less than two of the following are included in the data collection: |
| Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students' | • A detailed description of the data collected, how it was collected, and when it was collected | • A detailed description of the data collected, how it was collected, and when it was collected | • A detailed description of the data collected, how it was collected, and when it was collected | A detailed description of the data collected, how it was collected, and when it was collected |
| mathematical proficiencies have increased as a | Data from a variety of sources. | Data from a variety of sources. | Data from a variety of sources. | Data from a variety of sources. |
| result of their instruction or their efforts in coaching/mentoring teachers. | • A timeline of the data collection process and planned interventions | • A timeline of the data collection process and planned interventions | • A timeline of the data collection process and planned interventions | A timeline of the data collection 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 | • A detailed explanation of the data analysis process so that someone else would be able to analyze the data and find similar results | • A detailed explanation of the data analysis process so that someone else would be able to analyze the data and find similar results | • 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. | • An explanation of the role of the critical friend(s) in data interpretation. | • An explanation of the role of the critical friend(s) in data interpretation. | 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 | The findings include all of the following: • The findings are clearly and | The findings include three of the following: | The findings include two of the following: | The finding include fewer than two of the following: |

| Demonstrate a broad experiential base of knowledge and skills working with a range of student and adult learners in varied school and professional development | thoroughly and presented. Themes from the findings are connected and coherently presented. | The findings are adequately presented. Themes from the findings are connected and coherently presented. | The findings are adequately presented. Themes from the findings are connected and coherently presented. | The findings are adequately presented. Themes from the findings are connected and coherently presented. |
|---|---|---|---|--|
| settings. | • Convincing evidence is provided that supports identified themes. | • Convincing evidence is provided that supports identified themes. | Convincing evidence is provided that supports identified themes. | • Convincing evidence is provided that supports identified themes. |
| | The research questions and the findings are connected. | The research questions and the findings are connected. | The research questions and the findings are connected. | The research questions and the findings are not connected. |
| | : IMPLICATIONS & REFI | | 1 | |
| IMPLICATIONS: | Both of the | One of the | Neither of the | No implications for |
| TEACHING & LEARNING | following implications for the teaching and | following implications for the teaching and | following implications for the teaching and | the teaching and learning of students are included. |
| NCTM Element 7a | learning of students are included: | learning of students are included: | learning of students are included: | |
| Gain an in-depth understanding of the mathematical development of students across all of the elementary grades. | • The reflection identifies the important understandings of student mathematical development and learning that were highlighted as a result of this experience. | • The reflection identifies the important understandings of student mathematical development and learning that were highlighted as a result of this experience. | 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. | The reflection explains the possible implications of student understanding and learning for teaching. | • The reflection explains the possible implications of student understanding and learning for teaching. | |

| IMPLICATIONS: | The reflection | The reflection | The reflection | No implications for |
|--|---|--|--|--|
| EDUCATIONAL | includes all the | includes two of the | includes one of the | the educational |
| FIELD, STATE & | following: | following: | following: | field are included. |
| LOCAL | 0 | 0 | 0 | |
| NCTM Element 7b Develop and use leadership skills to improve mathematics | • An explanation of the implications of the research and results for the educational field | • 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 for the educational field | |
| programs at the school and/or district level. | An explanation of the implications of the research and results on the national and state education standards A discussion of | • An adequate explanation of the implications of the research and results on the national and state education standards | • An adequate explanation of the implications of the research and results on the national and state education standards | |
| | limitations and future research possibilities | • A discussion of limitations and future research possibilities | • A discussion of limitations and future research possibilities | |
| 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 | • A self-assessment of how the self- study methodological components were addressed using the Five Foci chart | • A self-assessment of how the self- study methodological components were addressed using the Five Foci chart | • A self-assessment of how the self- study methodological components were addressed using the Five Foci chart | A self-assessment of how the self- study methodological components were addressed using the Five Foci chart |
| others. | A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching | A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching | A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching | A discussion of how critical friend feedback changed practice using evidence of deep reflection and self-study of teaching |

| | a A da animtian af | a A da animti an af | • • • • • • • • • • • • • • • | • • • |
|--------------------|--|--|--|---|
| | A description of |
| | the mentoring | the mentoring | the mentoring | the mentoring |
| | and use of inter- |
| | personal skills | personal skills | personal skills | 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 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 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 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 | The references | The references | The references |
| | meet all of the | meet four of the | meet three of the | meet two or fewer |
| | following | following | following | of the following |
| | requirements: | requirements: | requirements: | requirements: |
| | • All print and non- |
| | print (internet) | print (internet) | print (internet) | print (internet) |
| | references are | references are | references are | references are |
| | listed. | listed. | listed. | listed. |
| | References and | References and | References and | References and |
| | citations meet | citations meet | citations meet | citations meet |
| | APA formatting | APA formatting | APA formatting | APA formatting |
| | guidelines. | guidelines. | guidelines. | guidelines. |
| | References are | References are | References are | References are |
| | current. | current. | current. | current. |
| | References are | References are | References are | References are |
| | from varied high- | from varied high- | from varied high- | from varied high- |
| | quality sources. | quality sources. | quality sources. | quality sources. |
| | All references cited | All references cited | All references cited | • All references |
| | in the research | in the research | in the research | cited in the |
| | report are included | report are included | report are included | research report |
| | in the list of | in the list of | in the list of | are included in the |
| | references. | references. | references. | 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 organization includes five of the following: • A cover page with title, author's name, and professional affiliation | The report organization includes four of the following: • A cover page with title, author's name, and professional affiliation | The report organization includes three or fewer of the following: • A cover page with title, author's name, and professional |
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