



EdMthSci 598: Research Seminar in Mathematics and Science Education, Spring 2020

College of Education
Washington State University
Wednesdays 4:30-5:30
Pullman: SPRK 333
Spokane: No room provided
Tri-Cities: TFLO 210
Vancouver: VECS 209

Zoom Access: <https://wsu.zoom.us/j/821617490?pwd=TUJYQkh5ZnA5bVlvVlpSWENvb1dpUT09>

Instructor of Record: David Slavit
WSU Vancouver
VUB 330
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Email: dslavit@wsu.edu *Email is the most effective way to contact me.*
Office Hours by appointment

Other Participating Faculty

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Purpose of the Course

The overall purpose of the *Research Seminar in Mathematics and Science Education* is two-fold:

First, the course will enhance the *learning community* among doctoral students and faculty affiliated with the Mathematics and Science Education PhD Program.

Second, the seminar will provide an opportunity for all students and faculty affiliated with the program to engage in *meaningful, scholarly dialogue* and *collaboration about research in mathematics and science education*.

WSU College of Education (COE) Conceptual Framework

The WSU College of Education's conceptual framework is based on six proficiencies:

1. Knowledge Base
2. Theory and Practice in Education
3. Learners in Cultural Contexts
4. Engaged Learning with Meaning and Purpose
5. Ethical Leadership
6. Local and Global Responsibilities toward a Sustainable and Just Future

The research seminar will address each of these competencies as they relate to the areas of mathematics and science education.

Required Texts

None. Readings will be provided one week before each student or faculty presentation.

Course Sessions: Topics and Approach

Course topics will be based on areas of student and faculty interest, as well as current issues in mathematics and science education. Students have several options for leading a seminar session:

1) Article Discussion: A paper you have read outside of courses that you have found particularly useful.

Students identify an article of interest, provide it to all program members at least one week before the presentation, and then lead a discussion around various aspects of its contents (theoretical framework, methodology, results, and/or implications).

2) Wondering: An idea or question that you feel personally interested in and that would support an interesting discussion with the rest of us.

This option allows you to lead a deep conversation around a topic, question, or idea you have been thinking much about. If possible and appropriate, provide some prior reading material to help frame the conversation (anything from an article to your own notes). This type of session would likely be a more informal, less-structured conversation than Option 3. For example, you might lead a discussion that collectively unpacks a theoretical perspective or methodological framework, collectively pursues a question or issue of interest, or addresses a nagging dilemma, confusion, or vexation. The intent of this option is to facilitate a group-think around an issue you want to know more about, are perplexed by, or are interested in.

3) Research Presentation: Conference presentation, publication, or other work you are currently working on.

This option is intended to allow you to either practice an upcoming conference presentation or receive detailed feedback on an article in progress. You would provide us with a presentation outline and/or a draft copy of a paper. You would begin by presenting the work to an appropriate level of detail, and we would collectively engage in a critical dialogue around the work. Significant time should be allowed for discussion and questions, as well as feedback on the overall presentation, if appropriate.

4) Other: Student-generated format, pre-approved by course instructor.

Student presents a written, detailed session plan to the course instructor at least three weeks prior to the presentation date.

In addition, there will be three other possible seminar formats:

5) M&S Ed Faculty presentations – presentations led by faculty on current research work.

6) Guest speakers – presentations led by non-program faculty and students.

7) Coffee lounge - These seminar days will have no formal agenda, with the goal being to engage in more informal, spontaneous dialogue.

Student Learning Outcomes	Activities and Evaluation of Outcomes
Students will demonstrate a spirit of inquiry, scholarly dialogue, and increased understanding of current mathematics and science education research through active listening, dialogue, and reflection within the learning and research community composed of the Mathematics and Science Education PhD students and faculty.	Class discussions Weekly reflections

Attendance Policy for ALL Students in the Program

All students enrolled in EdMthSci 598 attend each week; all other students in the program are expected to attend as much as possible. It is also expected that students in the program lead or support the lead of a seminar session at least once per academic year. More advanced students should do so at least once after completion of all coursework; we encourage more advanced students to take advantage of the opportunity to practice presenting your own research work in this venue.

Assessment and Evaluation

The grade for EdMthSci 598 will be determined by two equally-weighted responsibilities: 1) three writing assignments and 2) course participation.

Students who fail to attend or participate in seminar sessions or fail to adequately respond to the adequate number of written reflections will be asked to meet with the instructor of record to discuss the issue and plan means of resolution.

The final grade for portion 1) of the evaluation will be determined by considering the mean of the numeric grades on the writing assignments as well as improvement over the course of the semester. Further, this portion of the grade might be adjusted upward, as grades on papers are intended primarily to provide formative assessment on writing quality.

Writing Assignments: 3 Analytic Reflections

Enrolled students must submit *three* 2-page, single-space analytic reflections in Word format over the course of the semester. The paper should have three parts: 1) a *brief* overview or summary of the seminar topic and session, 2) an analytic discussion of the scholarly aspects of the reading and session, and 3) a *brief* reflection on the impact, or potential impact, the session had on your professional growth. The paper should be professionally written with an appropriate level of scholarship, and should provide a scholarly analysis of the session and related reading. The paper can be emailed to the instructor at any time prior to the deadline. Please consider the following three things when you write the reflection:

- **Analysis and Reflection** – the paper should go beyond description and include high levels of analysis and reflection on a specific seminar session and reading
- **Grounded in Literature** – whenever possible and appropriate, comments in the paper should be based in, arise from, or tied to relevant literature
- **Structurally Sound** - please edit your paper for structure, grammar, APA, etc.

In addition, students should avoid turning in all three written reflections at the same time:

You should submit papers roughly one month apart.

Spring 2020 deadlines are 2/28, 3/27, and 5/1.

Students are also *highly encouraged* to find a “writing buddy” with whom you could exchange papers for peer review prior to submission. You could change buddies over the course of the semester, or keep the same one. This can provide several things:

- 1) fresh eyes and perspective on your writing
- 2) a cleaner and higher quality final paper
- 3) new learnings by reading someone else’s thoughts
- 4) the opportunity to interact closely with another member of our community (especially if you choose someone who you would like to get to know better!)

Course Participation

This course, by its nature, requires you to participate actively both in and out of class. You are expected to attend all classes and to conduct yourself in a professional manner. If you are late, it is your responsibility to notify the instructor (after class) of your presence. If you must be absent from class, please let me know before the missed session if at all possible. Classes will only be worthwhile if we have all read the assigned readings and are ready to actively participate in discussions about them. Excessive non-attendance (more than two absences for whatever reason) will automatically lower your grade by one letter.

At the end of the semester you will be asked to complete a form (see below) regarding your participation. To ensure that your grade is representative of your contributions to the class, I suggest you keep a log of substantive contributions to each class meeting. I cannot always be present to hear small group conversation, and I will not be able to keep detailed records of everyone's participation everyday. Thus, I value your input. Keep in mind that I maintain the right to move your grade up or down.

An email listserv for all members of the program (mathscied@lists.wsu.edu) has been created to support pre/post seminar comments throughout the semester.

PARTICIPATION FORM

Please write one paragraph explaining why you self-assessed your participation at the level you indicate. This will be due the final day of the course. The criteria below serve as a guideline. If you believe you should receive a certain grade, but do not meet the stated criteria, please indicate why.

14-15 Exceptional: You have not missed class, arrived late to class, OR left class early on more than one occasion. You were prepared for each session by having read and reflected on the required reading, perhaps even doing additional related reading on occasion. You were always prepared for class as evidenced by the substance of your whole-class and small-group comments, which you regularly made. Your comments elevated the discussion level by drawing on specific aspects of the reading and other related literature, and by expanding on current ideas, introducing new ideas, or asking insightful questions. You were always an active listener and participant in course activities. You never talked for the sake of talking or served as a distraction for other students.

13-14 Excellent: You have not missed class or arrived late to class/left class early on more than one occasion. For the other criteria, you satisfy or come very close to satisfying the above description but fall short in one or two aspects.

12-13 Good: You have not missed class or arrived late to class/left class early on more than two occasions. For the other criteria, you come very close, but fall short, to satisfying the above descriptions.

. . . You can fill in the rest of the rubric if need be . . .

Participation Grade: _____ (Note: You may assign a numeric grade up to one decimal place; e.g., "13.7")

Explanation/Justification for this grade (one paragraph):

Tentative Course Schedule*

1/15	Introduction – Norms; Student/Faculty introductions; Seminar Schedule
1/22	Janet Frost , Director Spokane Campus and Clinical Instructor of Mathematics Education, WSU Research Discussion: Applying STEM school math education approaches in a comprehensive high school
1/29	Cancelled in lieu of Science Education Candidate Presentations
2/5	Stassia Feltes , Mathematics and Science Education PhD Program, WSU Research Discussion: Undergraduate research to retain STEM major students Article: Schneider, K. R., Bickel, A., & Morrison-Shetlar, A. (2015). Planning and implementing a comprehensive student-centered research program for first-year STEM undergraduates. <i>Journal of College Science Teaching</i> , 44(3), 37-43.
2/12	Coffee Lounge
2/19**	Eva Thanheiser , Associate Professor of Mathematics Education, Portland St. U. Research Discussion: Making mathematics meaningful for preservice teachers Article: Thanheiser, E. (in progress). Mathematics to understand and critique the world: Reconceiving mathematics in a mathematics content course for elementary school teachers. Manuscript currently under review.
2/26	Rachel Halsey , Mathematics and Science Education PhD Program, WSU Research Discussion: Veterinary educator teacher development Article: Gordon-Ross, P. N., Kovacs, S. J., Halsey, R. M., West, A. B., & Smith, M. H. (under review). Veterinary Educator Teaching and Scholarship (VETS): A case study of institutional faculty development program to advance teaching and learning.
3/4	Judy Morrison , Associate Professor of Science Education, WSU Research Discussion: Teaching science to ELL students Article: Morrison, J. (under review). Supporting science learning for English language learners.
3/11	Allison deVincenzi , Mathematics and Science Education PhD Program, WSU Wondering: Categorizing middle school student statistical work according to the SOLO framework.
3/18	NO CLASS – WSU Spring Break
3/25	Jessica Hoppe , Mathematics and Science Education PhD Program, WSU and Kristin Lesseig , Associate Professor of Mathematics Education, WSU Research Discussion: Math studio: Collaborative professional development
4/1	NO CLASS – WSUV Spring Break
4/8	Margarita Vidrio Magana , Mathematics and Science Education PhD Program, WSU Research Discussion: Mathematical self-efficacy in tracked classrooms Article: Lessard, V., Larose, S., & Duchesne, S. (2020). Does mathematics tracking influence student motivation? Exploring the classroom experience. <i>International Journal of School & Educational Psychology</i> , 8(1), 21-35.
4/15	Ryan Seidel , Mathematics and Science Education PhD Program, WSU Research Discussion: Two models for technology integration: SAMR and TPACK Article: McCulloch, A. W., Hollebrands, K., Lee, H., Harrison, T., & Mutlu, A. (2018). Factors that influence secondary mathematics teachers' integration of technology in mathematics lessons. <i>Computers & Education</i> , 123, 26-40.
4/22	Mukti Ryan and Kristen Harvey , Mathematics and Science Education PhD Program, WSU Wondering: Asynchronous learning: Benefits and guidelines. Article: Junus, K., & Suhartanto, H. (2019). The Community of Inquiry Model Training Using the Cognitive Apprenticeship Approach to Improve Students' Learning

	Strategy in the Asynchronous Discussion Forum. <i>Journal of Educators Online</i> , 16(1), n1. https://files.eric.ed.gov/fulltext/EJ1204388.pdf
4/29	Henri Burns , Mathematics and Science Education PhD Program, WSU Research Discussion: Mitigating fear of minority girls in an after-school STEM plus computational thinking program. Article: Weintrop, D., Beheshti, E., Horn, M., Orton, K., Jona, K., Trouille, L., & Wilensky, U. (2016). Defining computational thinking for mathematics and science classrooms. <i>Journal of Science Education and Technology</i> , 25(1), 127-147.
	* Beginning Spring 2020, all non-student seminar presentations will be advertised on the WSU COE listserv. Students sessions will also be posted unless prior notice is given to the Seminar instructor. In some cases it is reasonable to not wish such advertising, as there are many reasons why this might not be the best option.
	** Presentation via Zoom

General Information

Academic Integrity. Academic integrity is the cornerstone of the university and will be strongly enforced in this course. Cheating is defined in the Standards of Conduct for Students WAC 504-26-010 <http://app.leg.wa.gov/wac/default.aspx?cite=504-26>. Any student found in violation of the academic integrity policy, including but not limited to plagiarism, may be given an “F” for the course and will be referred to the Office of Student Conduct. For additional information about WSU’s Academic Integrity policy/procedures, please contact 360-546-9573. If you have any questions about what constitutes plagiarism or how to cite sources properly, please do not hesitate to contact the professor. If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at <https://studentaffairs.vancouver.wsu.edu/student-affairs/student-conduct>.”

Disability Accommodation. Reasonable accommodations are available for students with a documented disability. All accommodations must be approved through your WSU Disability Services office. If you have a disability and need accommodations, we recommend that you begin the process as soon as possible. For more information, contact a Disability Specialist on your home campus.

- **Spokane** <https://spokane.wsu.edu/studentaffairs/disability-resources>
- **Pullman** <http://accesscenter.wsu.edu>
- **Tri-Cities:** <http://www.tricity.wsu.edu/disability/index.html>
- **Vancouver:** <http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services>

WSU Safety Statement: “Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “**Alert, Assess, Act**,” protocol for all types of emergencies and the “[Run, Hide, Fight](#)” response for an active shooter incident. Remain **ALERT** (through direct observation or emergency notification), **ASSESS** your specific situation, and **ACT** in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the [FBI’s Run, Hide, Fight video](#) and visit the [WSU safety portal](#).”

AWARE Network. The AWARE Network is an online resource with a list of important resources as well as an Assistance and Referral Form that can be completed by anyone on campus if they have concerns about a particular student. The idea is to make it convenient and easy for the campus community to report a student situation of concern. The online form and other resources are located at <http://aware.vancouver.wsu.edu>

Inclusion statement. The instructor of this course is committed to teaching equitably and inclusively, addressing the academic needs, concerns, and interests of every student, regardless of age, gender, race/ethnicity, religion, social class, sexual orientation, English language proficiency, or disability.

Instructional approach. The primary instructional approach used in this course will be small and large group discussions. An emphasis will be placed on active student participation in discussions and activities.

Professional communication. The faculty members of the Teaching & Learning Department and the College of Education emphasize the importance of effective written and oral communication for professional educators. Students of the program are expected to demonstrate that they can meet standards of professional communication on all of their assignments. A student who fails to adhere to the conventions of writing (e.g. makes consistent grammatical and/or spelling errors, frequently misuses words or phrases, fails to organize writing in an effective manner) may be required to work with the Writing Center or complete additional coursework. Students who fail to meet expectations after being provided with opportunity for remediation and improvement may be removed from the program. Students will also be held accountable for demonstrating that they are capable of clear and professional verbal communication.

SELECTED BIBLIOGRAPHY

- American Psychological Association. (2018). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC.
- Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 59(5), 389-407.
- Bogdan, R., & Biklen, S. (2007). *Qualitative research for education: An introduction to theory and practice*. Boston, MA: Allyn and Bacon.
- Creswell, J.W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications, Inc.
- Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks, CA: SAGE Publications.
- National Governors Association Center for Best Practices & Council of Chief State School Officers (NGA) (2010). *Common Core State Standards for Mathematics*. Washington, DC: Authors.
- National Research Council. (2011). *Successful K-12 STEM education: Identifying effective approaches in science, technology, engineering, and mathematics*. Committee on Highly Successful Science Programs for K-12 Science Education. Board on Science Education and Board on Testing and Assessment, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
- NGSS Lead States. (2013). Next Generation Science Standards: For States, By States. Retrieved from <http://www.nextgenscience.org/>

NOTE REGARDING AMS

All videoconferenced classes through AMS are recorded and the videos are available via the Blackboard course website.

You have the ability to review these videos once they are posted to the site (which takes approximately 24-48 business hours after the class ends) and the videos remain on the site until the end of the semester. However, these streams are not guaranteed and are only a courtesy of AMS.

These video streams are not intended to be used as a primary way to access classes.