

**MTED 6310**  
**Research Trends in Mathematics and Science Education**  
**Summer 2019– Syllabus**

University of Texas at El Paso  
College of Education, Department of Teacher Education

<b>Instructor</b>	Dr. Song An	<b>Email:</b> saan@utep.edu
<b>Office Phone</b>	915-747-7616	
<b>Office Hours</b>	Education Building 201 T & W 12:00 pm– 1:00 pm (Other time by appointment)	
<b>Class Time</b>	Online sessions throughout the semester	
This syllabus is subject to change as needed.		

**Course Description**

This course will explore critical issues of the development of fundamental mathematical and scientific ideas. We will examine current trends in the research area of STEM education, having students engage literature to understand theoretical underpinnings of the field, current research projects in effect, and future trends as STEM education evolves as a practice and as a research interest. The course uses foundational concepts of learning in the fields of psychology, sociology and educational research to understand critical implications of the current body of literature.

**Course Objectives/Student Learning Outcomes**

<i>Students enrolled in this section will have multiple academic goals to achieve:</i>	<i>Instructor will use following assessments to evaluate students' learning outcomes</i>
1. Understand the seismic shifts and major trends in educational research	a. Course graded assignments b. Individual Meeting/Oral exams
2. Analyze educational research in different decades and identify patterns	a. Course graded assignments b. Online discussions
3. Synthesize recent research with interdisciplinary and international vision	a. Course graded assignments b. Research presentations
4. Develop mid and long-term personal research agenda to fit current research trend	a. Course graded assignments b. Individual Meeting/Oral exams

**Required Reading Recourse**

*(All available in the Blackboard)*

- National Research Council. (2002). *Scientific research in education*. National Academies Press.
- National Research Council. (2004). *Advancing scientific research in education*. National Academies Press.
- Berliner, D. C. (2002). Comment: Educational research: The hardest science of all. *Educational Researcher*, 31(8), 18-20.
- Cobb, P., Confrey, J., DiSessa, A., Lehrer, R., & Schauble, L. (2003). Design experiments in educational research. *Educational Researcher*, 32(1), 9-13.

### **Participation and Professionalism**

All doctoral students are expected to demonstrate the ethical and professional values associated with the Teaching, Learning and Culture PhD program. It is critical doctoral students adopt and exhibit a professional demeanor at each point in their teacher preparation. Evidence of professional dedication will be expected through all work during classes and practicum, seminar, presentation, and clinical experiences. Credit for participation and professionalism will be part of the evaluation.

### **Technical Assistance**

If you have technical problems with the course, please contact the UTEP Helpdesk: M - F: 7AM - 8PM, Sat: 9AM - 1PM, Sundays 11-4 pm.

- On campus phone: 915.747.5257
- Off campus: 915.747.4357

If you are on campus, you may also visit the ATLAS lab located within the Undergraduate Learning Center (UGLC building) or the Technology Support Center in Room 300, Library.

### **Assignment Format and Late Assignments**

All assignments must be submitted electronically unless specified. It is highly recommended you save all your work electronically and possibly a hardcopy for your records before turning it in. The following format is **required** for every assignment submitted. Deviating from the format may result in reduced points, returned paper, or rejection of the assignment completely. All assignments should be double spaced and typed with 12-point font; page numbers should be included if more than one pages. **You must label your assignment as you save it containing your name and the assignment name.** Only assignments submitted complete and on time will be considered for full credit. Without evidence that you were unavailable (sick) for the entire range of days, the assignment will be given a zero. Any assignments turned more than one week late (or the range of dates for submission) will receive zero points.

### **Policy on Academic Dishonesty**

The University of Texas at El Paso prides itself on its standards of academic excellence. In all matters of intellectual pursuit, UTEP faculty and students must strive to achieve based on the quality of work produced by their individual. In the classroom and in all other academic activities, students are expected to uphold the highest standards of academic integrity. Any form of scholastic dishonesty is an affront to the pursuit of knowledge and jeopardizes the quality of the degree awarded to all graduates of UTEP. It is imperative, therefore, that all faculty, insist on adherence to these standards.

Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, and any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed

regulations, as printed in the Handbook of Operating Procedures (HOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation, to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others.

### **Students with Special Needs**

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protections for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides a reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please notify your instructor and contact Disabled Student Services (DSSO) at 747- 5148 or at [dss@utep.edu](mailto:dss@utep.edu) or come by Room 106 Union East Building.

### **Course Requirement**

#### **Class Participation**

Students are expected to participate in all online activities as listed on the course calendar. You are expected to fully participate in the multiple assignments and discussions beyond your initial responses to any questions. Also, you are expected to fully comply with the due times and dates for tests, and other assignments. Failure to turn in two major assignments results in student being dropped.

#### **Assignment Format and Late Assignments**

All assignments must be submitted electronically unless specified. It is highly recommended you save all your work electronically and possibly a hardcopy for your records before turning it in. The following format is required for every assignment submitted. Deviating from the format may result in reduced points, returned paper, or rejection of the assignment completely. All assignments should be **double spaced** and typed with 12-point font; page numbers should be included if more than one pages. You must label your assignment as you save it containing your name and the assignment name. Only assignments submitted complete and on time will be considered for full credit. Without evidence that you were unavailable (sick) for the entire range of days, the assignment will be given a zero. Any assignments turned more than one week late (or the range of dates for submission) will receive zero points.

#### **Online Discussions** (*5×8 Course Points, Due Each Thursday Midnight*)

In each week, you will prepare answers to our weekly discussion questions. Throughout the semester you will participate a series online discussions about strategies and issues in educational research process. You should post answers to each discussion questions (no less than 200 words), the answer should be brief, meaningful, well thought-out, and articulate. Post your first response by the due days and post your follow up responses in the following two days. Read all the postings of your peers, and interact with your peers in a positive manner. You will reply at least three of your classmates' posts in a meaningful way.

### Assignments

- *Master students develop a One Year research plan in assignment 3*
- *Master students have a waiver for assignment 4 & 5*

#### **Assignment 1: Identify Trend in Educational Research (Part 1)** (12 Course Points) (5 pages excluding references and cover page, double-spaced, free style)

You will find one of productive and active researchers with around 10 years working as a professor (who promoted as full professor within the past 3 years or with less academic experiences) in one of **flagship** tier one research universities (e.g. University of California, Berkeley, University of Colorado Boulder, University of Texas at Austin, Columbia University, Stanford University). Select 20-25 **first author and/or single author** articles that this research published across the career (doctoral student stage, pre-tenure stage, and post-tenure stage). Explore the patterns across these studies from the perspective of **coherence** in research topic and methodology.

#### **Assignment 2: Identify Trend in Educational Research (Part 2)** (12 Course Points) (5 pages excluding references and cover page, double-spaced, free style)

You will find one of the best researchers in your research filed with an **H-index** higher than 40 (who retired in the past 3 years or still serving in a university). Select 20-25 most cited **co-author articles** (your target researcher served as the 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> author in the publication) that this research published across the career (with an emphasis of post-tenure stage). Explore the patterns across these studies from the perspective of **diversity** in research topic and methodology.

#### **Assignment 3: Five Year Research Plan Development** (12 Course Points) (10 pages excluding references and cover page, double-spaced, APA style)

You will develop a research plan that can guide your research for the next 5 years (fall 2016-summer 2021). By indicating your general research goals, and specific research objectives for each semester, you will propose your research designs and methods and describe your research timeline with research phases and individual research activities for data collection and analysis.

#### **Assignment 4: Peer Review** (12 Course Points) (2 page for each research plan, free style)

You will review three of your classmates' research proposal that assigned by the instructor. You will write a short review report for each proposal by following the Review Checklist from the National Science Foundation for long-term research plans. In the review report, you need to evaluate your classmates' proposals against Intellectual Merit & Broader Impacts

#### **Assignment 5: Article Development Plan** (12 Course Points) (3-4 pages, double-spaced, free style)

You will develop a plan to guide your article development and publication. You will propose **at least 10 articles** to be published based on your five year research plan—for each article development plan you need to prepare an abstract that covers (1) a tentative title, (2) research purpose questions, (3) data resources.

