MICHIGAN STATE
UNIVERSITY

11/15/2017

Dr. Mehmet Aydeniz
Department of Theory and Practice in Teacher Education (TPTE)
College of Education, Health, and Human Sciences
University of Tennessee, Knoxville
Knoxville, Tennessee 37996

Dear Dr. Mehmet Aydeniz and Search Committee Members,

I am writing to apply for the Assistant Professor in Theory & Practice in Teacher Education at the University of Tennessee. I am a doctoral candidate in Educational Psychology and Educational Technology with a concentration in science education at Michigan State University and will defend my dissertation in April 2018.

My research focuses on students' development capabilities central to engaging in STEM, but that can be challenging for both teachers and students, namely, how students think of and with data. This involves designing and documenting student engagement in the context of classrooms using diverse methodological approaches. My work informs, and is informed by, learning theory, research about student learning in STEM, and, in recognition of the accelerating roles of computation in scientific practice, educational technology research.

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As an example of my work informing both psychological and science education research, my dissertation, *Examining Work With Data in STEM Through the Lens of Engagement Theory: A Person-Oriented Approach Using an Experience Sampling Method*, examines how more than 200 learners in out-of-school science, mathematics, and engineering-focused programs engage in work with data through constructing measures of real-world phenomena and developing models that account for variability or uncertainty. While many scholars have argued that work with data can be understood in terms of learners' capabilities developed through work with data, my research shows that these practices can be understood in terms of engagement and the teacher support students receive. As another example, I worked in a research-practice partnership with instructional design team members at Michigan Virtual School (MVS), Michigan's statewide public online course provider, to increase opportunities for students in their classes to use data. Specifically, I designed a computational science simulation focused on a smell traveling across a room that output quantitative data in real-world units and then researched how students understood the scientific phenomena and their accounts of variation in the data they collected and modeled.

My research has been published in peer-reviewed journals, including, for example, the *Journal of Research in Science Teaching* and the *Journal of Technology and Teacher Education*, and publications and presentations for practitioner-focused audiences. In total, I have published or have in-press eight peer-reviewed journal articles (including four first-author publications) and have four articles presently under review. In addition to publishing in journals, edited books, and conference proceedings, I am experienced in applying for extramural support for research, most recently through contributing to the grant proposal for Jennifer Schmidt's National Science Foundation (NSF)-funded project *Profiles of Science Engagement* (PSE), which I plan to stay involved in the next three years. In addition to these research efforts, I aim to have a direct, sustained, and mutually beneficial impact on classroom teaching and learning. For

example, as part of my ongoing partnership with MVS, I worked with the instructional design team to identify an important need related to students' work with data and design a novel solution. I also carried out a webinar on the topic and then wrote for a general education audience on student motivation in statewide science classes offered by MVS in their practice-oriented *Research, Policy, Innovation & Networks* blog, for which I was also asked to write about student work with data in online science classes.

In addition to research experience, I have substantial and diverse teaching experience, having independently taught or assisted 21 course offerings at Michigan State University. As an experienced instructor at the university level—and as a teacher at a public high school in a past career—I know that learning about powerful ideas and developing ambitious capabilities takes time, application, and a network of support. Accordingly, in my teaching, I focus courses on semester-long tasks that are supported by the structure of assignments and an emphasis on student-directed discussion and use a myriad of educational technologies, some from my research projects, to support student engagement and learning. For example, in a research methods course, students identified a problem related to teaching with technology, constructed measures, and analyzed the data they collected and shared their work through a class social media page. This approach has been well received with student ratings consistently rating my teaching between "Superior" and "Above Average." I am prepared to teach classes at the undergraduate and graduate levels in science education, including in K-12 science teaching methods and assessment, science and STEM education research, and the role of technology in teaching and learning science, in particular the use of tools for modeling and simulation. I am interested in teaching courses on motivation in science and on the use of newer digital research methods in science education, including network analysis and the use of natural language processing approaches in conjunction with traditional research methodologies.

I have been involved in service in large education research associations (Division C of the American Educational Research Association and Division 15 of the American Psychological Association) and have also been involved in a leadership position for the Technological Pedagogical Content Knowledge (TPACK) special interest group in the Society for Information Technology and Teacher Education (SITE), having served as co-chair. As one outcome from my service with SITE, I served as editor for a special issue of *Australian Journal of Educational Technology* focused around the SIG's membership. Finally, I am active in my program, having mentored junior Ph.D. students on multiple practicum committees, coordinated the social media platforms associated with my program, and served on a search committee for an academic specialist position.

With respect to the required and preferred qualifications for the position, I have a research agenda focused on a high-impact topic science education that has the potential for significant impact in the field. This work, focused on designing activities around engaging in work with data in science and documenting student learning using a variety of methodological approaches, is well-suited to the present position because of its focus on core topics in science education and opportunities to collaborate with scholars in other STEM education disciplines, both in the Department of Theory and Practice in Teacher Education and across the College of Education and University. Additionally, I have knowledge and experience using a variety of research methodologies, including traditional qualitative and quantitative approaches as well as newer approaches, and have shown the ability to use these approaches to carry out studies with the strong potential for external funding. Finally, as a former science educator and, at present, a teacher educator, I am an experienced instructor at the post-secondary level and I have interest and preparation in teaching K-12 science education coursework and in preparing students to become confident science educators and scholars.

I look forward to hearing from you soon. Thank you.

Sincerely,
Joshua M. Rosenberg
Joshua Rosenberg