12/15/2017

Dr. Robb Lindgren and Dr. Bill Trent
College of Education at the University of Illinois
1310 S. 6th St.
Champaign, Illinois 61820

Dear Dr. Robb Lindgren and Dr. Bill Trent and Search Committee Members,

I am writing to apply for the Technology Innovations in Educational Research and Design (TIER-ED) at the University of Illinois. I am a doctoral candidate in Educational Psychology and Educational Technology at Michigan State University and will defend my dissertation in April 2018.

My research focuses on how learners come to work with data as part of their learning. The aims of this work are to design activities and tools to make data analysis more intuitive to students. In addition to working to make data analysis more accessible to learners, I also make use of new sources of data in my research, particularly "digital traces" in the forms of written text, log-trace data, and social media data that can help us better understand learning in technology-rich learning environments. Thus, this work is applicable to the aims of the TIER-ED initiative because it contributes to solutions to core educational issues related to learning with technology across STEM domains. *It also has strong implications for preparing students to engage in design and inquiry and to consider what the role of data science, fast growing in industry and at the graduate levels, implies for undergraduate and K-12 education.* This work also supports the aims of the initiative of facilitating engagement because it is grounded in learning sciences theories of engagement. I also draw from research on educational technology in recognition of the accelerating role of computation in education and research.

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I have researched transformative teaching and learning activities, in particular, those that support students to work with data, at the K-12 levels and post-secondary levels, and in face-to-face and online learning environments. For example, I have been engaged in a three-year partnership with the state-wide online course provider in Michigan, Michigan Virtual School (MVS), focused around students' use of authentic data sources as part of their science classes. In this work, I used both traditional (i.e., self-report measures of student motivation and embedded written assessments) and digital sources of data from the Learning Management System to understand student learning in these contexts. In my dissertation research, I use Emergent Motivation Theory to understand how learners' perceptions of the challenge of an activity and of their competence impact their cognitive, affective, and behavioral engagement as part of work with data—particularly measuring and modeling practices—in out-of-school STEM programs. As a final example, I have also partnered with teachers to understand, for instance, how online communities of learners can diffuse innovative practices through the use of social network models and methods to explore influence in formal (in the case of the MSU Urban STEM project) and informal (State Educational Twitter Hashtags) online communities.

My work has appeared in peer-reviewed educational technology (i.e., *Journal of Research on Technology in Education*) and science and general education research journals (i.e., *Journal of Research on Science Teaching*). I have also published research through multiple book chapters and conference proceedings, including the proceedings for each of the past two

International Conferences of the Learning Sciences. I also contribute to the development of tools for both researchers and teachers, such as statistical software for *R* and tools that integrate with the Concord Consortium's tools for learners, such as the simulation I developed through work with MVS. In addition to these research efforts and products, I aim to have a sustained and mutually beneficial impact on teaching and learning with technology. For example, with MVS, I carried out a workshop on student motivation in online science classes, informed by data I collected and then wrote for a general education audience through the MVS blog. I also have experience applying for support of research independently and as part of collaborative research projects. For instance, I contributed to Jennifer Schmidt's National Science Foundation grant funded project, *Profiles of Science Engagement*, that I will continue to be involved with over the next three years.

In addition to research experience, I have substantial and diverse (i.e., face-to-face, online, Massive Open Online Course [MOOC], and K-12 public schools) teaching experience. In my teaching, I focus on semester-long tasks with real-world application. For example, in a research methods course for in-service teachers, my students identified a problem related to teaching with technology, collected and modeled data, 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." This work has informed my research, particularly on practical frameworks for technology integration, writing about the roles of TPACK and SAMR, and in particular how both need to be considered from a more context-sensitive view. I am prepared to teach courses at any level in educational technology, including in learning in online communities, modeling and simulation, and social and ethical aspects of technology use. I bring extensive methodological expertise in both mature and cutting-edge approaches, and I am prepared to teach courses on research methods. I am particularly interested in proposing and teaching classes on computational methods and on creating data products (such as interactive web applications and data visualizations) for research and learning.

I have also been involved in service in large education research associations and leadership positions in educational technology associations. In particular, I served as co-chair of the Technological Pedagogical Content Knowledge (TPACK) special interest group in the Society for Information Technology and Teacher Education (SITE). 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 research of the SIG's membership. I am active in my program through mentoring junior Ph.D. students as part of research projects and on multiple practicum committees, and serving on a search committee.

With respect to the required and preferred qualifications for the candidate for this position, my research on supporting and better understanding work with data contributes to the aims of the TIER-ED cluster through addressing topics that cut across STEM domains. This work can also lead to promising collaborations with scholars in other departments in the College of Education, such as those in the Educational Psychology and Curriculum and Instruction Departments and with those engaged in the new data science initiatives, such as those offered through the Computer Science department. Furthermore, I have substantial experience not only leading and carrying out studies examining learning and engagement in technology-rich settings but also working as part of large, interdisciplinary collaborations. My contributions can support existing work around the use of data analytics methods as well as partnerships that can lead to new ways for students to work with data. Furthermore, I see promising opportunities to collaborate with scholars both in the TIER-ED cluster and initiative to push back on the notion that the role of data in education is to make decisions about students, rather than for students to be empowered to make decisions and solve problems themselves and to use data for research in ways that are theoretically driven and have a positive impact on teaching and learning practice.

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

Sincerely,
Joshua M. Rosenberg
Joshua Rosenberg