Rural Engagement to Advance Learning In STEM Digitally (REALISD) in School Libraries

Dr. Melissa P. Johnston, College of Education, University of West Georgia &
Dr. Dan Albertson, Department of Library and Information Studies, University at Buffalo

The Challenge: Research finds that STEM education equips students with the skills needed to take advantage of career pathways in their regions, strengthens local workforce development, and increases employment opportunities and entrepreneurship. Rural schools in particular face formidable challenges with STEM initiatives (Smith, 2015). Even in rural areas with resources and access to technology, there is a lack of educators who possess the necessary content, technological, and pedagogical knowledge to facilitate applied STEM learning (Ossala, 2014). Yet, schools in rural areas of the US have not yet been a major focus of federal STEM education funding (e.g. Carnegie Science Center; *Huffington Post*, *U.S News & World Reports*).

The Proposal: A school librarian equipped with STEM domain knowledge, applied digital proficiencies, and innovative educational understanding can engage students and assist teachers to facilitate STEM learning (Johnston, under review). Support is requested for a collaborative **project grant** between the University of West Georgia (UWG) and the University at Buffalo (UB) to **continue the education** of rural school librarians through the Rural Engagement to Advance Learning STEM Digitally (REALISD) in School Libraries program. Over the 3-year project period, a partnership between STEM educators, school library leaders, and digital resource experts will deliver professional development (PD) learning experiences for 80 school librarians from rural areas in southeastern (SE) and upper midwest (MW)/western northeast (WNE) states. Rural areas here comprise some of the lowest socioeconomic indices and hardest hit postindustrial economies of the US.

Project Goal: UWG, UB, and the expert advisory team will collaboratively develop and deliver the REALISD in School Libraries program, which will provide a comprehensive PD experience for school librarians in rural underserved areas to increase their knowledge, skills, and abilities for facilitating STEM education within their own respective school libraries (IMLS Performance Goal 1: Learning).

The REALISD in School Libraries Program: A total of five PD modules will be created by the Co-PIs in collaboration with the expert advisory team. Modules 1-4 will be delivered in separate standardized sessions held onsite at The STEM Fusion Center Learning Facility at UWG and STEM Instructional Spaces at UB. The onsite sessions will take place during the summers of 2018 & 2019; one session will be held at each location each summer. A four-day onsite session will be structured to include:

- Module 1. Content Knowledge: STEM Disciplines in K-12 Education
- Module 2. Technological Content Knowledge: Digital STEM Tools and Resources
- Module 3. Technological Pedagogical Content Knowledge: Applied STEM Teaching and Learning
- Module 4. Community Connections: Enriched STEM Learning with Civic and Cultural Organizations
- Module 5. Implementation in Context: STEM in Practice

Module 5 is a required online component that will continue throughout the following school year. Participants will have weekly obligations for participation in an online community of practice and for ensuring progress toward a final STEM in Practice plan that takes into account their individual context(s). These plans will be used to assess progress toward Module objectives and ultimately serve as a "roadmap" for facilitating STEM activities in their own libraries. Participants will be expected to engage in a REALISD webinar, together with the Co-PIs, to promote the program and the modules, as well as discuss experiences and final plans.

Project Work Plan: October 2017 – May 2018: Project PIs and the expert advisory team will work together virtually to create the PD modules by building upon existing STEM learning projects (ex. *STEM-ALL*), the literature, and individual expertise. The team will also develop the REALISD website to serve as the primary channel for recruitment and dissemination. By May 2018, the first 40 participants (20 per session for summer 2018) will be recruited through comprehensive efforts that include the REALISD website, PI attendance at state library conferences, as well as AASL conferences, posting to listservs, and direct email to contacts in the field. The advisory team will assist with application review to ensure that diverse and devoted groups are selected.

Summer of 2018: The official launch and delivery of the four-day onsite PD sessions of the REALISD program will take place, with one four day session at each location. These onsite sessions will include 20 participants whose travel, tuition, and community connections outing will be supported through project funds.

Summer 2018 – May 2019: The first group of 40 participants will continue participation online from their home schools. Throughout this time, evaluation and refinements to the REALISD PD modules will be conducted. The STEM in Practice plans of the initial 40 participants will be developed and evaluated. The next group of 40 participants will be recruited. Co-PIs will share project progress and findings on the REALISD in School Libraries website/blog, in periodic webinars, and in school library related conferences and journals.

Summer 2019 – Summer 2020: Forty more participants from the target areas will be recruited to participate in the second round of onsite sessions (Summer 2019), again, followed by collaborative online participation from participants' home schools. Continued evaluation and revision of the PD modules will be conducted for final dissemination to the larger community. Final project data will be collected and reported to IMLS.

Relevance to IMLS Funding Priorities: This project is relevant to the IMLS strategic plan, *Creating a Nation of Learners,* specifically in support of the goal of creating engaging experiences for learners in libraries that prepare them to be full participants in their local communities and a global society. Addressing the project category of "Community Anchor," this project seeks to build new knowledge and skills of school library professionals to improve their ability to address STEM needs and facilitate lifelong learning in their schools and the larger rural communities.

Impact: The REALISD project will educate 80 school librarians from rural areas of the SE and MW/WNE US to support mastery of new skills that facilitate STEM learning in these rural school libraries, as will be demonstrated by the application of the STEM in Practice plans. With the PD Modules and resources being available online, there is potential for practicing school librarians and SLM programs to support the needs of 21st century students.

Project Outcome: The REALISD program will result in 80 newly prepared school librarians in rural areas and the creation and delivery of 5 PD modules. All learning modules and other materials will be licensed through OER/Creative Commons and made available to school libraries across the US. For sustainability, the modules will be utilized to create a STEM-focused graduate level course to be added to the SLM preparation curriculum at UWG and UB. In order to document evidence of measurable change, data will be gathered from participants on the specific IMLS Performance Measurement Statements using a pre/post test approach. The STEM in Practice plans and other data collected from participants can serve as a basis for comparison of the different communities represented in the project and broader analyses of these primary geographical regions.

Estimated Budget: A total direct cost of $371,520 is requested from IMLS for the REALISD program. Project Personnel: The proposed budget will support partial reimbursement for: 1) efforts of the PIs over summer months (salary and fringe) at $100,000, 2) $20,000 total for consulting fees for STEM area experts ($10,000) and project evaluator ($10,000). The total combined estimated cost for personnel is $120,000. Support of $8,000 over three years is requested for project-related travel for purposes of recruitment and project dissemination at conferences, such as AASL, ISTE, AERA, and local state conferences. Student Participants: Tuition for one three-credit hour experience for 80 participants will be $120,000. Course credit is necessary for recertification purposes of school librarians. Tuition support will assist recruitment. The estimated cost of the onsite participation for all participants is $80,000. Total indirect costs will be $43,520. Cost share for non-student support budget items will be $171,520.

Personnel: PI Johnston provides expertise in the area of school librarianship and technology integration, along with 13 years experience as a school librarian. Johnston completed funded needs assessment research on school librarians supporting STEM in 2016. **Co-PI:** Albertson teaches and researches in the area of digital libraries, including in the context of science education. The expert advisory team will include: Terry Young, STEM educator/school librarian; Melissa Jacobs, School librarian/STEM PD expertise; Dr. Kristin Fontichiaro, data literacy, maker, and school librarian PD expertise, Dr. Lucy Santos-Green, school librarian educator and I^2STEM consultant; Dr. Mega Subramaniam, STEM and the school librarian researcher; STEM educator, Gail Marshall; and Randy Yerrick, STEM educator/researcher. Dr. Nancy Everhart will serve as project evaluator.