

DIGITAL SEED GRANT WINNERS AND FINAL PROJECTS 2018-2019

ABOUT

Walker Library *Digital Scholarship Initiatives* supports individual and collaborative digital scholarship projects in research, teaching, and public outreach from any discipline on campus. The Digital Seed Grant is an annual award for start-up funds, developed to encourage and create opportunities for faculty, staff, and graduate students to use digital technologies in their research, service or teaching.

The Digital Seed Grant (dsi.mtsu.edu/dsgrant) had an impressive amount of applications for its second year (award period 2018-2019), which initially launched in 2016 for the award period of 2017-2018. Due to the quantity and quality of proposals, the Digital Seed Grant Review Committee and Dean of Libraries decided to award two grants for the 2018-2019 academic year.

The awardees were announced on the website at <https://dsi.mtsu.edu/dsgrant18-19>. Below are brief summaries of the winning projects (in no particular order) and a link to their individual outcomes.

3D Biology: Making Claims in the Midst of Natural Variation

Primary Investigator (PI): Dr. Anna Strimaitis Grinath, Biology Department

PI's Project Description: This project drew upon the 3D printing and laser cutting technology available in the Library Makerspace at MTSU to create 3D material to support cognitively demanding biology tasks in three undergraduate biology lecture courses: Exploring Life, General Biology II, and Biometry. We designed tasks to support students to develop quantitative and inferential reasoning around concepts of variation in populations and population sampling. Such reasoning is critical for students to make biological claims in the midst of the natural variation that is inherent to populations of organisms. However, such tasks are rare in biology education lecture settings, and when they do occur, students often are expected to investigate biological questions using 2D representation of organisms (e.g. paper cut outs), which limits the authenticity of the biological investigation and the opportunities students have to grapple with problems of measurement, variation, sampling, and drawing inferences about a population from a sample.

The two tasks we designed through this project asked students to investigate questions around two different focal organisms: marine sponge individuals and freshwater fish populations. We created a 3D scan of a real sponge, augmented the 3D scan file with a texture file to capture the form of the organism, and printed 30 replicate models of the sponge using 3D printing technology. Additionally, we used the laser cutter to create 20 populations of over 100 fish of varying sizes out of Baltic birch plywood. With the 3D materials created from this project, we have already successfully implanted the two "3D Biology" tasks in three different undergraduate biology lecture courses at MTSU and the materials and lessons will continue to be implemented

in future courses. When enacting the tasks, we also collected multiple data sources to understand how the materials created in this project support student learning. Analysis and lesson plan development is ongoing. This Digital Seed Grant also helped strengthen the NSF proposal that is in preparation.

Resulting Research and Publications Produced:

Grinath, A.S., Jones, R.S., Whitworth, C., Google, A., Morphis, H. (presented 2019). 3D biology lessons: Designing across biology, data modeling, and argumentation. Poster presented at the annual meeting of the Tennessee STEM Education Research Conference, Murfreesboro, TN. (Regional).

Jones, R.S., Grinath, A.S., Jia, Z., Czap, L., Google, A. (presented 2019). Leveraging student ideas about measurement and variation in biology. Paper presented at the annual meeting of the Tennessee STEM Education Research Conference, Murfreesboro, TN. (Regional).

Whitworth, C. (presented 2019). Students' ideas about sampling and measurement. Poster presented at the annual MTSU College of Education Scholars Day, Murfreesboro, TN. (Local).

Grinath, A.S., Jones, R.S., Whitworth, C., Google, A., Morphis, H. (2019). Data MAKER Biology Framework: Designing across biology, data modeling, and argumentation. Poster presented at the annual meeting of the Society for the Advancement of Biology Education Research, Minneapolis, MN. (National).

Project News:

'Population Variation'. Listen to July 17 2018 'MTSU on the Record' with host Gina Logue and guest Dr. Anna Grinath at <https://mtsunews.com/grinath-3d-biology-july2018/>

Professor Uses New Grant To Explore Biology Under the Sea in 3D on 'MTSU on the Record'. Host Gina Logue interviews Dr. Anna Grinath on the library Digital Seed Grant Award and resulting project. <https://mtsunews.com/grinath-on-the-record-july2018/>

The Geography of Suffering: Enhancing Historical Interpretation at Stones River National Cemetery

Primary Investigator (PI): Dr. Derek W. Frisby, Global Studies and Human Geography Department

PI's Project Description: "The Geography of Suffering: Enhancing Historical Interpretation at Stones River National Cemetery's" objective sought to enhance the historical interpretation of the Stones River National Cemetery by digitizing the cemetery's records and integrating GIS/GPS interpretive capabilities for park staff, researchers, and visitors. Additionally, the project explored methods to incorporate Volunteer Geographic Information (VGI) for the cemetery to broaden the interpretive experience at the park beyond the park's boundaries. This project would have been impossible without assistance from MTSU Walker Library's Digital Initiative Seed Grant funds. The student training and research hours sponsored by the grant proved invaluable. It allowed me to delegate tasks and get the enormous amount of data organized and ready for integration into

the geospatial model. In return, I believe they received a wonderful experiential learning experience in historical GIS projects.

Project News:

'The Search at Stones River.' Listen to July 5 2018 'MTSU on the Record" with host Gina Logue and guest Dr. Derek Frisby at <https://mtsuneews.com/frisby-stones-river-july2018/>

'MTSU On the Record' Follows Military Expert's Searches for Answers at Stones River National Cemetery. Host Gina Logue interviews Dr. Derek Frisby of the library Digital Seed Grant Award and resulting project. <https://mtsuneews.com/frisby-on-the-record-july2018/>

FUNDING AND SUPPORT

The Digital Seed Grant is made possible by generous funding and support from the Dean of Libraries and the Digital Scholarship Initiatives project team. For many, this is a starter grant, which can lead to national grant opportunities in the future and Walker Library wants to encourage and support such creativity activity.

As a competitive grant, evaluation of applications and assessment of digital lifecycles of selected projects takes time. The Digital Seed Grant is indebted to the time of the Review Committee, comprised of digital project experts from Walker Library and the Digital Partners (a rotating member from the Department of History, Center for Historic Preservation, Center for Popular Music, Albert Gore Research Center and the University Archives). The Walker Library also thanks those that help promote the grant and encourage participation.

The 2019-2020 call for proposals closed; and those projects will continue until June 30, 2020. As those projects are completed, the following website will be updated: <https://dsi.mtsu.edu/dsgrant19-20>.

The 2020-2021 call for proposals will open March 1, 2020 and the application deadline is April 10, 2020. For more information on the Digital Seed Grant and access the application, visit <https://dsi.mtsu.edu/dsgrant>.