

Visualizing the Future Research Proposal

Dorothy Ogdon and Delores Carlito

Quickly and easily creating and evaluating polished and efficient data visualizations is a highly desirable skill for students, faculty, and researchers in educational, professional, and personal settings. Data visualization combines the skills of interpreting visuals (visual literacy), understanding data (data literacy), analyzing the source of the data (media literacy), and understanding the veiled socially-constructed contexts (critical literacy). It involves both creating and interpreting information in visual formats, and it is addressed in ACRL Information Literacy Framework, Mackey and Jacobson's Metaliteracy, and transliteracy. A knowledge gap in data visualization exists due in part to the idea that techniques and software tools for data analysis and visualization can be quickly and easily self-taught through the use of video tutorials and materials freely available on the internet.

Creating a visualization by following a tutorial, while providing a short-term positive outcome (a completed project) does not support the development of crystallized knowledge or a functional understanding of data, data formats, or the functions of a technology tool. The outcome of our *Visualizing the Future* proposal is to develop a framework of threshold concepts necessary for using data-related tools effectively (both evaluation and creation) that can be used across disciplines and for lifelong learning.

This proposal consists of three stages. In stage one, we will map data formats, evaluate content mapping software packages, and analyze the literacies needed to create and evaluate visualizations. In addition, we will conduct a literature review and question faculty in various disciplines about their students' visualization needs. Our goal in the first step is to draw connections between visual, data, media, critical, and quantitative literacies while noting gaps in the literature.

The second stage of this project focuses on linking the foundational framework from the first stage to a series of activities designed to support active learning while also creating a functional understanding of specific components of our framework through the production of specific types of visualizations. At this step, we will be teaching a concept rather than a tool to create the foundational knowledge needed to communicate data effectively. We will work with active learning using task-based activities to illustrate the concepts. Since our interest is in creating a framework of threshold concepts in data visualization, we will use the framework with faculty and students in numerous, unique disciplines. The activities will be done through workshops for students at the library and faculty and researchers through the Center for Teaching and Learning.

The third stage consists of evaluating the participants' ability to "read" and "write" data visualizations through a combination of creation and evaluation. The project's final product will be a framework of threshold concepts in data visualization that can be used across disciplines and for lifelong learning. The results of this project will be disseminated through publications and conference presentations.

Our proposal is a team project. Since data visualization involves data use and reuse, data interpretation and visual literacy, the Emerging Technologies Librarian and the Information Literacy Coordinator will work together to accomplish one goal. The results will allow us to educate students and faculty cross-discipline to be able to research, create, and evaluate visual data. Delores Carlito, UAB Libraries' Information Literacy Coordinator, recognizes that the ACRL framework involves more than just text-based formats and therefore teaching in the library classroom may include not only general resource evaluation

but image-based evaluation on several levels. Dorothy Ogdon, UAB Libraries' Emerging Technology Librarian, provides instructional sessions and consultations on research poster design, tools for creating data visualizations, and the use of citation management and systematic review software. This project would enable her to explore and develop evidence-based approaches to teaching the use of technology tools to more effectively support students, faculty, and researchers engaged in scholarly and scientific communication

Students and faculty are facing visual and data-filled content in academic and everyday venues. As information literacy moves away from what is considered a "traditional" literacy model to metaliteracy, instruction is needed on the interaction, creation, and evaluation of the intersection of formats and modes. A framework of threshold concepts for data visualization and its relationship to other literacies (creating not just a metaliteracy but a megaliteracy) is needed to unify all disciplines for modern-day "reading," "writing," and "arithmetic."