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Employable skills seminar for undergraduate psychology majors and minors: Data visualization in Tableau for the public good

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Employable Skills Seminar for Undergraduate Psychology Majors and Minors: Data Visualization on *Tableau* for the Public Good

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Abstract

Six undergraduate psychology students in a pilot, one credit, online seminar developed technical, inquiry, and data visualization skills. Students used *Tableau*, a popular business intelligence platform, and learned to locate, clean, aggregate, and visualize secondary data. A final project required the publication of visualizations for the public good.

The Need

Carnevale, Cheah, and Hanson (2015) reported that over half of all undergraduate psychology majors do not go on to earn a graduate degree. Thus, employable skills that differentiate this proportion of our graduates from job seekers holding similarly generalizable undergraduate degrees are important (Landrum, 2018). While many of the "soft" skills employers desire are already recognized by psychology majors (e.g., interpersonal skills; Miller & Carducci, 2015), more preparedness with regard to the applicability of degree-related competencies in data analysis and reporting to fields such as business, healthcare, education, and human resources would be of benefit to our students (Appleby, 2017); employers desire employees who are able to arrive at solutions to problems in a defensible manner (Landrum, Hettich, & Wilner, 2010) and relying on appropriately curated, analyzed, and communicated data helps toward this end. Given these considerations, a one-credit online seminar was piloted to introduce psychology students to Tableau, a popular data visualization platform.

Method

Students self-selected into the course, which was open to any psychology major (declared or admitted to the major) or minor with no prerequisites required. Two majors, three pre-majors, and one minor completed the eight-week course. Baseline and follow-up quantitative data were obtained using the technology and analytical skills subscales from the Employable Skills Self-Efficacy Survey (ESSES; Ciarocco & Strohmetz, 2018) via prompts posted to the online course space. Additionally, a student feedback form was also used to collect qualitative data for course assessment and future improvement.

Early instructional modules relied on resources available for teachers through the Tableau Corporation (Philips, 2017), but were enhanced through the development of companion video demonstrations for my students that reframed the work as relevant to the psychology major. These modules introduced students to Tableau, including installation, linking to or importing various data formats, joining tables from different data sources, creating calculated fields, and authoring techniques for various descriptive visualizations (e.g., charts, maps). I created later course modules to support student completion of a suicide awareness and prevention final project. In these later modules, students worked with global and US trend data related suicide, building their knowledge about observed trends through related scholarly literature, and produced visualizations with companion text suitable to educate members of the public.

Results and Discussion

All six students completed their final project by posting a multipaneled data story to *Tableau Public*, a platform that hosts publicly available visualizations (see Figure 1, below). Final projects were assessed by the instructor, remain available to the public, and are linked to each student's public Tableau profile.

Pre-post differences on the technology and analytical skills subscales of the ESSES subscales were not significant. Nevertheless, student feedback using a student response and review form provided essential feedback for course improvement, such as:

- replacing early Tableau-provided introduction modules with instructor developed modules as occurred later in the course;
- working toward the final project from the start of the seminar instead of on unrelated training datasets;
- authoring demonstration videos that more clearly noted mouse and click action in the Tableau interface.

Students also reported nascent skills they saw as valuable to both society and their workforce readiness (e.g., "I found the final project meaningful because it allowed for me/viewers to see patterns...in [my] data visualization to help convey a message and contribute to the prevention of suicide").

Student feedback will be used to revise and improve the course, which will be offered again in the 2019-2020 academic year.

Figure 1: Student Project Example - Suicide Awareness Data Story
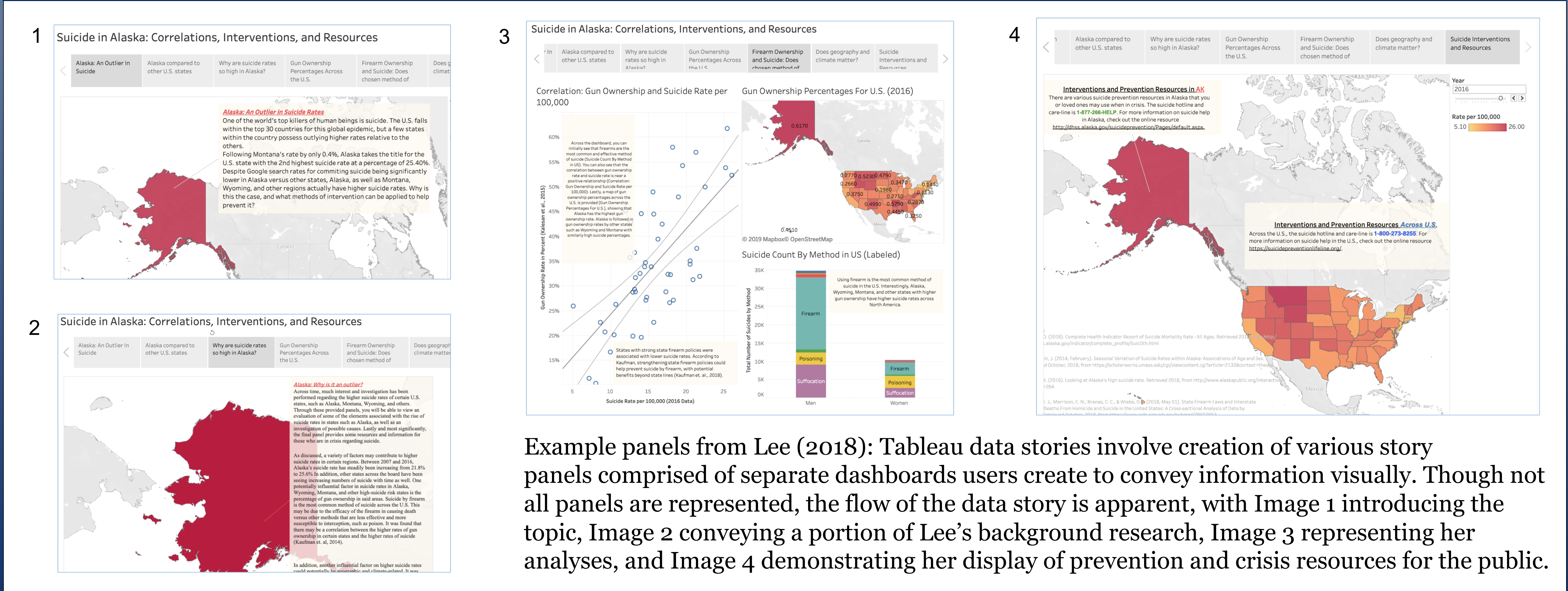
Example panels from Lee (2018): Tableau data stories involve creation of various story panels comprised of separate dashboards users create to convey information visually. Though not all panels are represented, the flow of the data story is apparent, with Image 1 introducing the topic, Image 2 conveying a portion of Lee's background research, Image 3 representing her analyses, and Image 4 demonstrating her display of prevention and crisis resources for the public.

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