

## **Building Data Literacy through Tableau: Launching a Workshop Series for Graduate Business Students**

KELLY LAVOICE

Vanderbilt University, Nashville, TN

[kelly.lavoice@vanderbilt.edu](mailto:kelly.lavoice@vanderbilt.edu)

Business librarians are increasingly being asked to engage in co-curricular partnerships, supporting students outside of the classroom as they prepare for their professional futures. Collaborating with colleagues in Career Management can help librarians identify learning opportunities for students to learn new skillsets and engage with new technologies. At the Walker Management Library, which serves the Owen Graduate School at Vanderbilt University, we are increasingly hearing students requesting opportunities to learn more about working with data, including programming languages and data visualization software programs. We explored the demand for and feasibility of creating a multi-session data visualization workshop for graduate business students and launched our first program in the spring of 2020. I will highlight the rationale for this programming, as well as the lessons we have learned from offering this workshop four times, including key partnerships, design elements, and valuable student feedback.

According to Gartner, a technological research and consulting firm, "By 2023, data literacy will become an explicit and necessary driver of business value, demonstrated by its formal inclusion in over 80% of data and analytics strategies and change management programs" (Duncan, 2020, p. 2). The demand for data literacy skills in the workplace requires deliberate placement of these skillsets to be embedded deeper in academic curriculums. A 2022 LinkedIn report "A Skills-First blueprint for Better Job Outcomes," argues that "the pandemic pulled the future forward, and digital skills are accelerating across all sectors" (p. 4). Data drawn from aggregated information from LinkedIn's global membership examined skill sets listed as requirements for jobs from 2015-2022 and found a 25% change. Analysts project a 50% change in skillsets for roles in 2027. Helping students build a foundation of digital literacy empowers them to gain confidence to enhance their skillsets as they continue lifelong upskilling in the professional world.

The need for digital skills is pronounced and growing, but employer strategies for addressing it can vary. From an employer perspective, "Poor data literacy, lack of a data-driven culture and talent shortages are prevalent and persistent inhibitors to the success of D&A [Data and Analytics]" (Sun et al., 2021). Librarians can address data literacy by expanding their portfolio of workshops, giving students opportunities to engage with data platforms and think critically about data analysis. This prepares students for the job market; our students may not be working as data scientists and data analysts, but they will likely be working with them or managing them.

The Association of American Colleges and Universities (AAC&U) partnered with Hanover Research to survey 496 executives and hiring managers in US companies about the skillsets of college graduates. The published report, "How College Contributes to Workforce Success: Employer Views on What Matters Most," highlights key findings. When asked about the importance of a potential employee's "ability to analyze and interpret data," 57% of respondents said "very important" and 34% of respondents said "somewhat important" (Finley, 2021). The author found a 16% preparedness gap between the "share of

employers who deem a skill to be "very important" and the "share of employers who report that recent graduates are 'very well prepared' on a particular skill" (p. 16). As a business librarian striving to promote data literacy in curricular and co-curricular initiatives, I find this gap particularly important and actionable.

There are numerous ways to address data literacy at the graduate business level. My colleagues and I decided to initially enter this space by planning a Tableau workshop series. Tableau offers free academic licenses to students and instructors, which enabled us to move forward. Tableau has been consistently ranked highly in Gartner's Magic Quadrant for Analytics and Business Intelligence Platforms (Richardson et al., 2021), receiving leadership recognition in the annual ranking since 2012.

We brought our idea to Owen's Career Management Center in the fall of 2019; it turned out our colleagues were simultaneously thinking about this same need. Students recognized the importance of building these skillsets for future employment and had reached out to their career advisors to inquire about additional learning opportunities. Our students recognized and articulated the importance of being able to communicate effectively using a shared language of data visualization. Our Career Management Center offered an Excel training but did not have someone on staff comfortable teaching Tableau. We agreed that Tableau goes far beyond Excel in its ability to import data from numerous sources, merge and join different datasets, create a series of shared dashboards for colleagues, and offers all of this in a user-friendly, drop and drag interface. Our colleagues told us that Tableau was the program they most heard mentioned by recruiters and said they would be thrilled if we could offer programming. At this time, only one credit-bearing course utilized Tableau and it was an elective, meaning that the majority of students did not have any required exposure to Tableau. This also ensured we were not duplicating efforts of faculty addressing other programs and skills through the formal curriculum.

Because we anticipated great student interest, we decided to require pre-advanced registration. We utilized the platform our Career Management Center uses for scheduling and registering recruitment events, since students are very familiar with this site and use it regularly. A downside to this approach was that we needed to ask a colleague from that department each time we wanted to pull information from that system, but the ease of use for students outweighed the slightly additional workload for library staff. We capped registration at 50 participants, and it filled on launch day. This was a key indicator that student demand for this programming was strong.

A critical element of our workshop, from both instructional design and time efficiency perspectives, is our ability to flip the classroom. We assigned students to watch videos and work with practice datasets in-between our live sessions. This ensured most of the live sessions could be used to work through problem sets, instead of demonstrating basic click and drag functionalities. Rather than creating these materials ourselves, we reviewed numerous tableau videos available in our library subscription to O'Reilly for Higher Education (<https://www.oreilly.com/online-learning/academic.html>). This database offers videos, ebooks, case studies, and other training programs on a wide range of topics, from Python to Teams to Leadership coaching. Video courses in O'Reilly usually include course GitHub sites with access to the datasets used in the training, allowing for active learning opportunities. We selected *Hands-on Visual Analysis with Tableau 10.x* (Acharya, 2018). In total, we asked students to watch about 3 hours of videos outside of our live sessions. While this is a large time commitment for a non-credit bearing workshop, the videos would allow students to learn more capabilities about the software than we could ever realistically cover in 2 live sessions.

We launched this workshop for the first time in the Spring of 2020, with over 50 participants. A few weeks before our session launched, Vanderbilt's campus shut down due to COVID-19. We quickly changed

our vision of an in-person workshop to a completely virtual offering. Since we had already planned on using the video series for remote aspects of the pre work, it was relatively easy to switch to online learning. For our initial Tableau offering, we hosted 2 synchronous virtual sessions. First, we held a session discussing best practices in data visualization and introducing Tableau. We then gave students a problem set, asking them to create visualizations that met certain criteria for 3 datasets. Students had the option of meeting with instructors during a set weekly office hour time. Our second live session allowed student volunteers to share their visualizations, leading the class in discussion about why they believe their choices were the best choices for that dataset.

We were overall happy with the outcome, but we did make changes to future iterations of this workshop based on student feedback from an evaluation survey. We were not surprised to find that not all of the students watched the videos or did the practice problem sets. This will always be a challenge when a program is not for credit. Overall, students found the video to be helpful and high quality but said the time commitment was too much. The students who completed the exercises asked for more concrete written directions; they wanted to be able to follow step by step to gain confidence. Multiple students made note of a desire for more instruction around cleaning data in Excel in general. This is important to note, as it is equally important for students to learn to visualize data in Tableau as it is for them to feel comfortable preparing data to analyze in other programs.

As of May 2022, the Walker Management Library has offered this Tableau workshop series 4 times. Each iteration has differed slightly from previous instances, as we continue to strive to incorporate student feedback into the workshop structure and content. Notable changes we have made since our first offering include:

- Adding a third live session with the instructors.
- Dedicating an entire live session to working through problem sets as a group; students were no longer required to independently complete exercises between class sessions.
- Decreasing the time commitment outside of class by shortening the prework exercises and assigning less video tutorials. Our lead instructor created his own table of contents for the video chapters we required, putting timestamps on sections he finds to be particularly important in relation to the assigned exercises.
- Adding additional co-instructors, including a librarian with expertise in instructional design.
- No longer requiring students to attend all 3 sessions live to receive a certification of completion. If students complete a final visualization, they can receive a certificate. This benefitted students with complicated schedules and allowed those with previous experience to dive right into the problem sets.

Here are the key lessons I learned from this process that I would believe would be valuable to other librarians considering launching Tableau workshops to teach data visualization.

There is a strong interest from graduate business students in learning more about data analysis and visualization. Specifically, Tableau is an in-demand program. This workshop continues to have the highest enrollment of any of our library offerings; we have reached almost 200 students during the 4 times we have offered this workshop in the last 2 years. We work alongside our colleagues in Career Management to ask if they are still seeing this interest from employers. We also continue to be mindful of potential

additions or changes to the curriculum that would integrate Tableau into additional credit-bearing courses, so we would not be duplicating efforts.

We have found using a preexisting, high quality video course allowed us to cover much more in-depth concepts than we could have if library staff needed to create their own content. It also allowed librarians who had no experience with Tableau to teach themselves the content, which enabled us to have additional instructors in the classroom to engage with students. While inevitably not all students will complete all of the videos, students have the option to go back and revisit the videos if they later engage in a project that utilizes Tableau.

Students really enjoyed working through the problem sets together. This was missing from our first, virtual iteration of the workshop. Since most of their curricular courses involve teamwork, it makes sense for us to utilize the same structure in our workshop. One of the great things about Tableau is that there is often not a "best" or "right" way to visualize data. Students quickly understood that the choices they made, in type of visualization, colors, dashboard features, etc. were key elements in their ability to tell a story. Seeing how peers chose to visualize the same dataset in different ways enhanced learning.

Students prefer having the workshop in person. While Zoom is convenient for numerous reasons, we plan to revert to an in-person session. Our colleagues in Career Services have suggested hosting in-person viewings of the O'Reilly training videos, which is something we will explore. A student also mentioned that they would prefer this format in our feedback form. They believe this will help with motivation and accountability to complete prework for a workshop series that is not credit-bearing.

Finally, and perhaps the most important lesson: our partnerships with colleagues in the Owen School of Management were critical for the design, implementation, and assessment of this workshop series. We rely on our colleagues in Career Management to let us know what employers and students alike are thinking regarding new skills and software. Students look to their career advisors for guidance about skills to learn during their free time and we are thankful they continue to send students to us for data literacy and skills development related topics. Administration's support was also critical for this workshop. We worked to ensure that we were offering something unique that would supplement the core curriculum and offered this program at times that would work well with the many other academic commitments of graduate students.

My team and I are thrilled that interest in our Tableau workshop is coming from students, faculty, and staff across the business school. During the 2022-2023 academic year, we are hoping to be able to offer a more formal certification to student participants. We are working with a team on Vanderbilt's campus to trial a new digital badging software, that would enable students to embed certifications into their LinkedIn profiles. The original video course we utilized was retired by the publisher, so we will be selecting a new digital course. While this involves additional preparation, selecting a new prepackaged video series is much less time consuming than designing our own videos. Finally, we want to explore the ability to offer a complimentary workshop in Power BI, another leading data visualization program that students may encounter in the workplace. As with Tableau, our learning outcomes will be for students to feel confident reading, preparing, analyzing, communicating, and persuading with data.

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