

Collaborating to Build, Adapt, and Evaluate Open Educational Resources (OER)

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Project Overview

Significant Statistics: An Introduction to Statistics is the primary course text for Virginia Tech's STAT 2004: Introductory Statistics. This open textbook* was created in approximately eight months as a collaborative effort between an Instructor, Open Education Librarian, and a senior-level undergraduate statistics student reporting to the librarian. It combines selected content from three other open textbooks: *OpenStax Introductory Statistics*, *OpenIntro Statistics*, and *Introductory Statistics for the Life and Biomedical Sciences*, with original graphics, additional worked and interactive examples, added and revised text, accessibility features, and a custom sequence and order. Author-created ancillary resources including video and audio are shared via the book. The book has benefited from multiple in-class field studies and student perception and preference surveys. At this time, it is undergoing external peer review and a third classroom field study.

Completion of this project relies on people and technology. Project collaborators brought diverse expertise to support the project, including subject matter expertise and pedagogy, ability to rapidly obtain student feedback, project management, planning, tools, and pacing, knowledge about accessibility, publishing practices and standards, writing/repairing LaTeX and HTML, instructional design, and technical platforms, and color theory, graphic design, and visual communication to name a few. Collaboration was critical to the success of this project; without the diverse skills of each collaborator, we would not have been able to achieve this degree of completion. The book also benefits from technology appropriate for this use; it was developed and is available in Pressbooks, a WordPress based publishing platform provided by the University Libraries.

This interactive session provides an overview of this project, including barriers, goals, and expected benefits, support available, early design decisions, development timeline, processes including involving students in the development process, and the challenges we overcame by working together. Instructors, librarians, and instructional designers, those with and without OER project experience, will benefit from facilitated discussion relevant to various institutions types and levels of support.

*Open textbooks are freely and publicly available and released under a license such as a Creative Commons license that permits their free use, reuse, modification, and sharing with others. Open textbooks are one type of open educational resource (OER). For more information on the difference between OER and Open Access please see: <http://hdl.handle.net/10919/94422.2>

Abstract

Although most instructors are concerned about the cost and fit of their course materials, many may not be willing or able to switch from the traditional publisher model due to a range of reasons including lack of time, knowledge, resources and support, institutional factors, and [un]willingness to change (Lashley, 2019; Conole & McAndrew, 2010). However, some instructors are able to reach their course material goals related to consistency, affordability, and fit by adopting collaborative approaches to authoring and adapting open educational resources (OER). Grant-funded and collaborative OER development approaches are increasingly offered by institutions of higher education. These initiatives aim to reduce costs to students and enable improved academic achievement due to increased student and instructor engagement, and better-fitting course materials (Walz, Jenson, and Salem, 2016; Colvard, Watson, and Park, 2018).

OER are freely and publicly available materials for teaching and learning released under a license (such as a Creative Commons) that allow no-cost adaptation and sharing (Hewlett Foundation, n.d.). While evaluation and impact of such resources is a relatively young field, early research shows positive outcomes. Namely that OER are of equivalent quality or better than commercially published materials (Clinton and Khan, 2019), showing no instructional harm and eliminating course material costs, and have a disproportionately positive impact on Pell-grant eligible and first-generation students (Colvard, Watson & Park).

Collaborative OER project support can include a range of financial incentives, development coaching, project management, copyright, open licensing, and publishing consultations, access to related software, graphic design, and assessment-related support for instructors. Completion and use of such curriculum resources has the benefit of decreased costs and potential for improved student academic achievements. Since 2014 the University Libraries at Virginia Tech have incentivized and supported faculty projects that create or adapt OER and publicly share them with the world.

The intended audience of this poster includes instructors and potential collaborators who are considering creating or adapting open educational resources and want to know more about the process of a collaborative development approach to OER and potential benefits to them and students. The process as presented is a high-level sequence of overlapping steps undertaken by one or more members of our time in creating *Significant Statistics*. This presentation also lists significant areas of inquiry which commonly arise and require decisions in such a project, and benefits as reported by students and realized so far by the instructor.

Discussion

The project team encountered and collaboratively resolved these questions during the planning and implementation phases of the project.

Significant Questions

Instructor

- What approach fits best for me (author, adapt/remix, or adopt an existing resource)?
- Is this project worth the level of effort in order to resolve expensive, ill-fitting course material issues?
- How will the quality of published output, changes to my course, and student academic achievement compare to existing material and the current level of student academic achievements?
- How can I maximize the public value of the curriculum resources I create?
- What tools and support are available at Virginia Tech?
- How would a project like this be best organized? Where does one start?

OER Librarian

- Am I attentive to what matters to my collaborators?
 - Do I clearly understand the instructor (and department's) goals and preferences regarding project outcomes, technology, disciplinary pedagogy, and related items?
 - Am I fostering a healthy, reasonable, respectful -- even fun -- environment for work and learning? Do I welcome and am I receptive to others' ideas?
- Am I clearly communicating decision points, tasks, and overall processes? Providing enough but not too much detail?
- How do we obtain information we need to be able to make informed decisions?
- What would it look like for students to have a larger role in contributing content?
- Are our project plans and current individual responsibilities reasonable and clear enough? If we are not using the organizational tools we built, what would help us to scaffold the work and keep making progress?
- What outside resources or assistance do I/we need to draw on to move forward?

Senior-Level Statistics Student

- What elements could be added to the book to make it more appealing to students like me?
- What can I contribute to this textbook to improve the quality?
- What value do students place on graphic design in textbooks?
- Am I clearly communicating a student perspective to the rest of my team?

In agreement with published literature, the instructor noticed a few benefits to students and to himself:

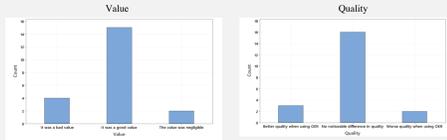
Benefits to Students

The instructor noticed two significant differences when using the material:

- **Significant improvement in student performance on assessments**

Assessment	2020 AVG	2019 AVG	Diff (20-19)	P-val (z)
T1	77.38	79.92	-2.54	0.55
T2	80.31	69.00	11.31	0.03*
T3	73.50	69.00	4.50	0.48
Final	78.73	68.73	10.00	0.016*
Test AVG	79.27	73.02	6.25	0.042*

- **Student perceptions:** Students reported good value and no noticeable difference in quality.



Student perceptions (continued)

- Students liked consistency between the textbook, lecture videos, and homework (reduced confusion)
- Students indicate a preference for no-cost materials

Benefits to the Instructor

- The more students experience continuity between different types of resources the less burden on the instructor
- Can easily change things
- Having things in your own voice, organized the way that you like
- Reportable activity for Faculty Activity Reporting

Current Status and Request for Feedback

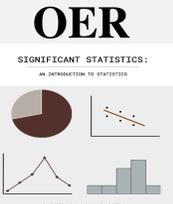
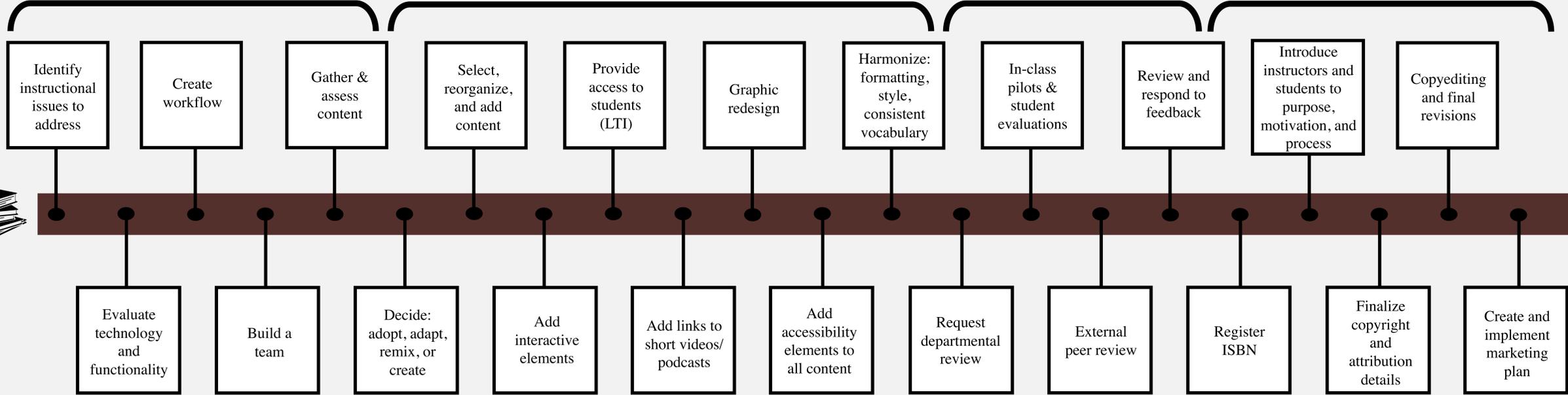
At the time of publication of this poster a draft of this book is available at <https://pressbooks.lib.vt.edu/introstatistics>. We welcome your feedback on the book at <https://bit.ly/feedback-stat>. *Significant Statistics* is currently in its third round of classroom field testing and undergoing external peer review. We anticipate publicly announcing our first final draft of the book in late spring/summer 2021. If you would like to receive notification of the book's completion kindly complete the following form: <https://bit.ly/stat-interest>.

Planning / Organization

Content Development

Feedback

Production



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References

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Rosa, Stack of Books, CC BY 3.0 <https://thenonproject.com/search/?q=stack+of+books&i=2157521>

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