Educational Research Study

To better understand teacher and student use of textbooks.

Methods
- Two open source electronic textbooks: linear algebra (Beezer) and abstract algebra (Judson)
- Sixteen courses at eleven institutions (variation by research intensity, size, location)
- Periodic logs filled by teachers and students over the course of a semester
- Teacher and student surveys of attitudes towards mathematics and technology
- Beginning and end of term assessment of student growth (mathematical maturity and course content knowledge)
- In-situ visits for seven courses that included planning and classroom observations and discussion of textbook use by teachers and students
- Commentaries on analytics user data collected automatically

Analysis
- Description of generation of documents (lecture notes) and the similarities and differences between users of electronic and print formats
- Description of use of textbooks in classroom and the similarities and differences between users of electronic and print formats

Findings—Teachers
- Use a variety of resources in generating their lecture notes
- Use features that they would use in their regular lesson preparation

Findings—Students
- Students’ use of textbook depends on teachers’ expectations of those uses: if teachers ask students to read the textbook, students will do so. If the teachers suggest using examples for solving homework, students will do so. If teachers bring new proofs, students will skip proofs on textbooks.
- Students find it difficult to describe what exactly they do when using their textbooks. Responses are too general.

AIM Open Textbook Initiative

- 47 vetted and approved undergraduate mathematics textbooks
- Editorial Board
- Evaluation Criteria
- Author’s Guide
- aimath.org/textbooks

Evaluation

External project evaluation provides formative and summative evaluation on processes, program events, research implementations, and participant feedback, using survey, interview, and observational data.

National Science Foundation Support

Partial support for this work was provided by the National Science Foundation’s Improving Undergraduate STEM Education (IUSE) program under Award No. 1626455. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.