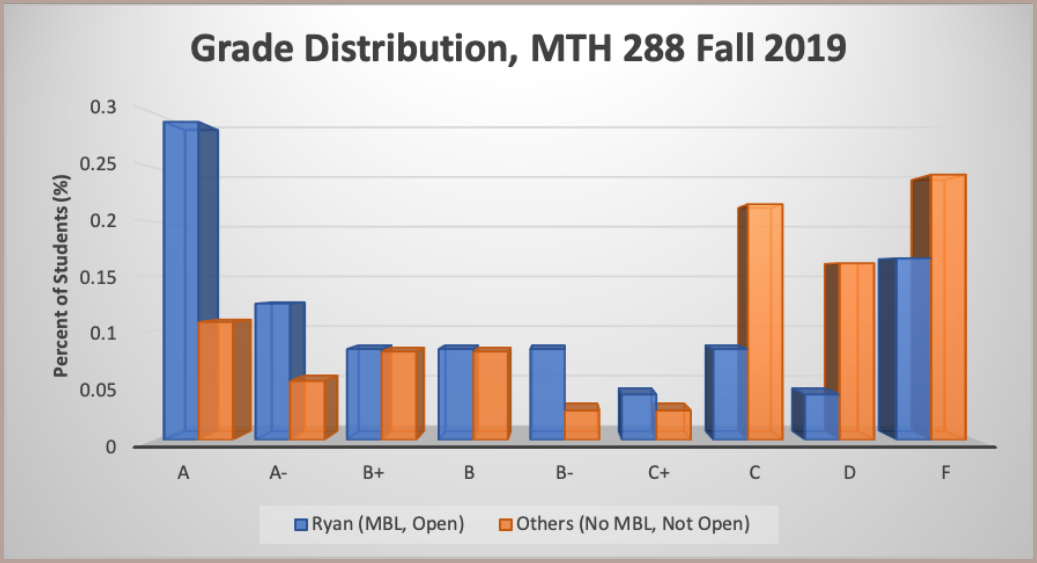
Module-based Learning (MBL) combined with Open Textbooks increased grade performance in MTH 288 Linear Algebra



For more information on this study and other research by Dr. Ryan, scan the QR code to visit https://academic.csuohio.edu/ryan_s/

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Module-based Learning and Open Textbooks in Linear Algebra

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Introduction

MTH 288: Linear Algebra was redesigned into smaller modules focusing on individual core topics with daily problems sets online. Each set gave students infinite attempts and direct links to further examples from the open textbook. This allows for mastery of the concepts and ensures that cost of a textbook is not a barrier.

Experimental Setup

Students were polled through an anonymous questionnaire at the beginning and end of the course to see how their opinions on both module-based learning and the use of Open textbook resources might have changed through the course of the semester. The control groups were the other two sections of MTH 288 taught by different instructors using a traditional lecture-based format and non-open textbook.

Results

We present some of the more interesting results here for faculty in the future to decide if they want to adopt either approach implemented in linear algebra:

Pro:

1. 95% of student said topics broken into modules was helpful for learning.
2. 95% preferred homework online with links directly to place in open textbook where they could read about the topic more.
3. 74% said the open textbook facilitates enhanced learning .
4. 84% of students said the enjoyed MBL with Open Access and would take a course in this format again.
5. 58% said this format could be generalized to most undergraduate mathematics courses.

Con:

1. 50% of students preferred traditional lecture to 30% for MBL.
2. 60% of students preferred weekly homework to daily homework so they could have flexibility to organize their time.