



Divisional Strategic Planning Brief – Mathematics

Campus Outcome:

Learning Assured – Continue to address, review, and improve low-performing programs and courses.

Department Outcome:

Learning Assured – Research alternative formats of course materials to improve the cost-effectiveness of required educational materials.

BACKGROUND & DESCRIPTION

In summer 2018, East campus math professors Joel Berman and Amanda Saxman, driven by the need for more low-cost and no-cost textbook options, conspired to create an Open Educational Resource (OER) MAT 1033C Intermediate Algebra course. Professors Berman and Saxman applied for and were awarded the Raymer F. Maguire Teaching Chair in the amount of \$19,400.

In fall 2018, Professors Berman and Saxman collaborated with fellow East campus math professor Steve Francis and East campus Math Center coordinator Richard Weinsier to build an OER Intermediate Algebra course. The course utilizes the OpenStax textbook, Canvas materials, and IMathAS homework platform.

INTERVENTION

Professors Berman, Saxman, and Francis combined their mutual desire for no-cost course materials to develop an OER MAT 1033C course. They felt that this course would need three major components to be successfully implemented in all modalities:

1. A no-cost textbook that aligns with the current course outcomes,
2. A no-cost homework platform that is algorithmic,
3. An organized learning platform with comprehensive video explanations and examples.

Professors Berman, Saxman, and Francis selected the OpenStax Intermediate Algebra textbook and Canvas materials by Rice University as the best choice to align to current course outcomes. The IMathAS homework platform was chosen, because it is already utilized by Valencia mathematics professors and

easily customizable to the OpenStax text. East campus Math Center Coordinator, Richard Weinsier, was consulted for his familiarity with this program.

A Canvas course template was constructed with introductory pages and syllabi for faculty to personalize and with instructional video pages that include content and video examples for each topic/exercise presented in the text. The instructional videos were primarily curated from www.mathispower4u.com and supplemented where needed. The even-numbered exercises from the OpenStax Intermediate Algebra were coded into IMathAS and integrated into the Canvas course. The Canvas course was designed to include the textbook pages, the video content with text content introductions and explanations, and the IMathAS homework exercises all organized and integrated into one resource.

STRATEGIC RESULTS

In spring 2019, seven faculty members (12 classes) piloted the new Open Educational Resource Intermediate Algebra course. Feedback was solicited from these faculty members halfway through the term to make changes or improvements as needed. Based on feedback from faculty, course topics that were underrepresented in the textbook were added to the instructional videos page through written content, examples, videos, and exercises added to IMathAS. Only minor adjustments were made to improve the course for summer 2019.

Feedback from faculty revealed five major themes. The table below provides quotes related to these themes from faculty members in the pilot.

Major themes	Quotes
Course materials were easy to use	<p>"...students [have] easy access to the book, instructional videos and homework."</p> <p>"The Canvas shell is easy to use, easy to modify and can transition easily to an online class, face-to-face class or flipped-classroom."</p>
The textbook is free and provides the same or better quality than paid options	<p>"Not only is the online version of the textbook free of charge, but students can also download a copy of the textbook (at no additional cost) so they have access to the textbook without being online."</p> <p>"Students very much appreciated the no cost textbook and homework. They didn't feel they were missing much when compared to using [other course materials that cost money]."</p> <p>"The textbook provides a plethora of step-by-step examples for students to follow."</p>
The instructional videos match the content well and are helpful to students	<p>"Several [students] mentioned that they watched the videos and liked them."</p>

	“The short video lectures within each module are perfect for students who might have been absent from class and/or need an additional refresher.”
The IMathAS exercises match the textbook and videos	“The question bank in IMathAS matches perfectly with the textbook and video content.”
There is excellent support for course materials	“The team provided very thorough documentation to assist us in setting up the course. They have been extremely helpful in addressing questions, typos, issues, concerns and have responded quite well (and quickly) to any and all feedback.”

Students from the 12 classes that were part of the pilot were surveyed to acquire their feedback about the course resources and additional Valencia support resources. Students were asked 1) if they used each resource and 2) how “helpful” they found that resource (score out of 5 stars). Fifty-five students completed the survey. Here are some highlights from the survey results:

- 55% stated that they used the Textbook Pages. There was a mean of 4.09 star “helpful” rating out of 5 stars.
- 66% stated that they used the Instructional Video pages. There was a mean of 4.45 star “helpful” rating out of 5 stars.
- 94% stated that they completed homework assignments through IMathAS. There was a mean of 3.53 star “helpful” rating out of 5 stars.
- 44% stated that they used their instructor email/office assistance. There was a mean of 4.64 star “helpful” rating out of 5 stars.

When asked to share additional thoughts about the course, students had the following positive statements:

“Everything was self-explanatory and easy to find.”

“It was a great course, the online homework had some mistakes but the teacher took care of them. I didn't use any of the other help options because I didn't really need too.”

“Nothing missing from canvas. It was on point.”

“The Canvas course was very helpful and the instructional videos were especially helpful.”

Six students expressed concerns over some technology issues and errors within the IMathAS program.

REFLECTION

Overall, the feedback from both faculty and students in the pilot was positive. Faculty members mentioned that the textbook was rigorous compared to other Intermediate Algebra texts, but they enjoyed teaching out of it and found the resources to be helpful and well-aligned. Verbal feedback provided to these faculty from their students was positive, but the faculty members did not feel that they were sure exactly which resources the students utilized and to what extent they felt they were useful. The student survey was employed to discover that information. There were a few technology issues with IMathAS that were handled swiftly at the start of term and additional and continued review of the technology will be necessary.

NEXT STEPS

The goal is to introduce these materials as an option at the next East/Winter Park Intermediate Algebra

textbook adoption committee and begin marketing to faculty on other campuses in spring 2020 or shortly thereafter, thereby saving Valencia students money in textbook and other related course materials.

More investigation is needed into feedback provided by students in the survey regarding technology issues and additional feedback will be requested from faculty (both new and from the pilot) who continue to use the course.

Additional data will be collected to determine if the students from the pilot were just as successful as those not in the pilot. The MAT 1033C common assessment questions administered by all MAT 1033C faculty will be reviewed summer 2019 to analyze whether students using this no-cost option show any difference in completing those questions correctly as compared to those who took a MAT 1033C course with resources that were not free.