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White Paper: Improving Student Success Through the Use of Open Educational Resources

Introduction

As of the 2021-2022 academic year, the average college student spends between $628 and $1,471 annually on textbooks and supplies (Hanson, 2022). The average price of a commercial textbooks is between $80 and $150 with some books costing as much as $400. Commercial textbooks on average increase 12% with each new edition. In addition to the high costs, these resources restrict access, offer limited flexibility, and often lackluster learning experiences (Griffiths et al. 2022). These inadequacies could impact students' overall success in their courses. Due to financial or other reasons such as access to the internet, students' may not be able to retrieve materials or experience delays in accessing materials, potentially causing an increase in withdrawal or failure rates.

Open Education Resources (OER) are an alternative to commercial textbooks that can lead to an increase in student cost savings, access, and quality of instruction (Griffiths et al. 2022). OER are openly licensed teaching materials that are freely available online for an instructor, student, or self-learner (Creative Commons, n.d.). Examples of OER materials include full courses, course modules, syllabi, lectures, homework assignments, quizzes, lab and classroom activities, pedagogical materials, games, simulations, and many more resources contained in digital media collections from around the world. OER course materials are designated with a Creative Commons license or exist in the Public Domain. A Creative Commons license manages the copyright terms that attach automatically to all creative material. It allows that material to be shared and reused under terms that are flexible and legally sound. In the OER educational environment these are known as the 5 R's (Wiley, 2014):

1. **Reuse** - Content can be reused in its unaltered original format - the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
2. **Retain** - Copies of content can be retained for personal archives or reference - the right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
3. **Revise** - Content can be modified or altered to suit specific needs - the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
4. **Remix** - Content can be adapted with other similar content to create something new- the right to combine the original or revised content with other material to create something new (e.g., incorporate the content into a mashup)
5. **Redistribute** - Content can be shared with anyone else in its original or altered format - the right to share copies of the original content, one's revisions, or one's remixes with others (e.g., give a copy of the content to a friend)

Improving Student Success Through the Use of OER was a two-year quality initiative study for accreditation conducted fall 2020 through spring 2022 at Yavapai College (YC). The study aimed to:
- Increase access to course learning materials
- Increase student cost savings
- Increase student course retention, completion, and persistence rates
- Determine if students enrolled in two or more OER courses in one semester are retained the next semester with more credits than students in non-OER courses
- Determine students' perceptions about participating in an OER course

- Determine faculty perceptions about teaching an OER course

Approach

The above-mentioned goals were addressed by:

Developing and offering training and professional development for faculty. An instructional designer from the college's Teaching and eLearning Services (TeLS) department and a dedicated OER faculty member created a six module self-paced online course to train instructors about teaching with OER and how to effectively build an OER course.

Collecting outcome data on student course retention, completion, and persistence in OER courses. Research has demonstrated lower drop rates for students enrolled in courses using OER, potentially increasing overall retention, completion, and persistence for those students (Wiley et al 2016). The college collected course retention, completion, and persistence data fall 2020, spring 2021, summer 2021, fall 2021, and spring 2022. The quantitative data was measured in the following ways: 1) student course retention was based on the number of students who remain in the course after the tuition due date, 2) the number of students who complete the course with a C or better measured course completion, and 3) persistence was defined as the number of students enrolled in the course who either enrolled in courses the following term or graduated/transferred out of the college.

Administering a survey to all students taking an OER course. At the end of each semester, a student survey was sent out in each OER course gathering quantitative and qualitative data. The survey used a combination of scale questions rating the quality of the OER material, the learning experience, the course design, the navigation, and how likely they would take another class taught with OER materials. Students were also asked two open ended questions, 1) "If this course did not use OER materials, on average a college textbook would have cost you $110 per course. Does not having to spend money on a textbook make a difference in your life? If so, how?" and 2) "What would you change, if anything, about the OER materials in the course?"

Administering a survey to all faculty teaching a course with OER materials. Faculty members who teach with OER materials also completed a survey including a combination of scale questions to rate how prepared students were the first day of class, how students read and/or utilized the OER materials, and if students had good comprehension of the course. Faculty were also asked three open ended questions, 1) "Describe any benefits and/or downfalls you and/or your students experienced this semester from the use of Open Educational Resources", 2) "What differences, if any, did you notice this semester when compared to previous semesters when you had a textbook with costs?", and 3) "What changes, if any, related to OER will you make for future semesters?"

Collecting data on students who take two or more OER courses and how many credits they register for the following term. Research suggests that students who take at least two OER courses in one semester take an additional .5 more credits the following term compared to students who are not enrolled in OER courses (Fischer et al. 2015).

Results

Through the implementation of the Improving Student Success Through the Use of OER Course Materials study, YC noted the following results.

Access to course learning materials.
Two data points were measured to illustrate improving access to course learning materials. First, all faculty interested in teaching and/or building OER course materials must have completed the OER training course described above. 108 faculty completed the training. Second, once faculty complete the training, they could submit a proposal to Build an OER course. Sixty-seven courses were built using OER, are openly licensed and located on YC's Creative Commons for other faculty to use.

Student cost savings.
Yavapai College created a Zero Cost OER Textbooks label (OERZ) for its Banner registration system. To receive this attribution, faculty must have completed the OER training, and their course needed to be reviewed and approved by TeLS. Faculty could have used a course that had already been built and approved by TeLS without going through the review process. Student enrollment for all courses with the OERZ attribution was collected. OERZ enrollment by term was as follows, fall 2020 (1,608), spring 2021 (1,579), summer 2021 (418), fall 2021 (1,912), and spring 2022 (1,777). Total OERZ enrollment for the

duration of this study was 7,294. Using the average textbook cost of $110, YC saved students approximately $802,340.

Student course retention, completion, and persistence.

Data collected through this study showed no significant difference for the retention and completion rates as compared to students enrolled in non-OER courses. Average retention rates for the four semesters (fall 2020, spring 2021, fall 2021, and spring 2022) in OER courses was 87.09% and non-OER courses was 88.82%. Average completion rates for the four semesters in OER courses was 74.24% and non-OER courses was 79.02%. Based on these results, the use of OER materials in the courses did no harm to student retention and completion. Based on past studies, no harm is demonstrated when the use of OER results in students performing at least as well as they did with traditional materials (Young et al. 2017).

When examining the data by ethnicity, there was a slight improvement of underrepresented students who participated in OER courses. For this study, underrepresented students include, Hispanic/Latino, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Pacific Islander, and two or more races. Retention and completion rates for underrepresented students in OER courses experienced a 6% increase from fall 2020 to spring 2021. Both retention and completion rates among underrepresented students stayed consistent in following terms.

Students enrolled in one or more OER courses were examined and compared to students enrolled in all non-OER courses and tracked how many of those students either enrolled in classes the following term or graduated/transferred out of YC. The sample size included 4,177 students enrolled in OER courses and 3,553 students enrolled in similar non-OER courses. The average persistence rate was 80% for students enrolled in OER courses and 79.80% for students enrolled in non-OER courses. When disaggregating the data to only include students from underrepresented ethnicities, there was a slightly higher persistence rate for students enrolled in OER courses (80.23%) compared to students enrolled in non-OER courses (78.78%).

Students who enroll in two or more OER courses in one semester are retained the next semester with more credit hours than students in non-OER courses. Next semester credits of students enrolled in two or more OER courses were tracked and compared to students that were not enrolled in any OER courses. Based on the data, students enrolled in two or more OER courses carried an average of 2.5 more next semester credits than those students who did not take any OER courses. This is consistent with previous research studies conducted and aligns with the hypothesis that when students save money on textbooks, they reinvest that money in the next semester on an extra class. Results from the student surveys discussed in the following paragraph also aligns with this hypothesis; 19.49% of students who indicated they either spent or saved the extra money on personal matters indicated it was spent or saved for tuition.

Student perceptions about participating in an OER course.

Student surveys were administered at the end of each term during this study. A total of 1,918 students completed the survey. The survey included 1 yes or no question, 10 scale questions with ratings strongly disagree, disagree, neutral, agree, and strongly agree, and two open ended questions. When asked if they had ever purchased a textbook for a course but did not use it, the group was evenly split 49.72% yes and 50.28% no. Over half the students (58.49%) agreed or strongly agreed with the statement, "purchasing textbooks is financially difficulty for me." Just under half the students (45.83%) agreed or strongly agreed with the statement "the OER no textbook fee was a factor in my decision to choose this course." Based on responses from the open-ended questions, it seemed that many students learned about OER once enrolled in the course. The two statements regarding ease of use, "I was easily able to find my way around the text and/or materials" and "the course was presented in an organized and easy-to-follow format" had overwhelmingly high agree and strongly agree responses, 84.23% and 88.16% respectively. Most students (74%) agreed or strongly agreed that the OER materials made it easier to learn and be successful. 85.02% agreed or strongly agreed that the quality of the OER course content was excellent and if given a choice, 73.01% prefer OER materials. Student responses also indicated

76.13% would like to take more OER courses and 79.79% would recommend a course that uses OER.

The first open-ended question asked students if not having to spend money on a textbook made a difference in their life. A total of 1,693 students responded to this question and most students (86.77%) expressed that it did make a difference, followed by 10.57% stating it did not make a difference and 2.66% not applicable (N/A). Out of the 10.27% in which the textbooks savings did not make a difference, 15.64% stated they are receiving some form of financial aid, scholarship, or grant, or their employer is reimbursing them for the course and materials and 10.61% wrote that they still liked receiving free resources. Out of the 86.77% in which the textbooks savings did make a difference, 39.82% stated that they used the extra money to pay for or support personal matters. The top five areas students spent the additional funds, ranked in order of frequency were tuition, groceries/food, school supplies, paying bills, and car/gas/repairs. These finding further support data regarding next semester credits.

Faculty perceptions about teaching an OER course.

Faculty surveys were administered to better understand the perceptions of faculty teaching OER courses. A total of 37 faculty who taught at least one class with OER materials completed the survey for the fall 2020, fall 2021, and spring 2022 semesters. The survey included three scale questions and three open-ended questions. Based on the results, 81.43% of faculty agreed or strongly agreed that their students were prepared the first week of class. 83.63% agreed or strongly agreed that their students read and/or utilized the OER materials during class and 83.63% agreed or strongly agreed that their students had good comprehension of the text(s) or material(s).

The first open-ended question asked faculty to describe any benefits or downfalls students may have experienced during the semester using OER. Some common themes for benefits included no cost to the student, positive course quality, and students access to the materials. Some common themes regarding any downfalls included teacher personalization and course quality (specifically organization). The second question asked faculty what changes (if any) they would make to the OER for the future. Faculty mentioned they would like to add more original content or update the content to

make improvements. Lastly, faculty were asked what differences (if any) they noticed from this semester compared to previous semesters when they had a textbook with a cost. The top three responses included nothing, access, and increased engagement.

Conclusion

This study has allowed YC to gain experience and knowledge about OER, how it can be implemented at the college, and integrated into other programs. YC plans to continue advocating for the use of OER and encourage faculty to adopt or build OER for their classes. Using the results of this study, YC will be launching a targeted outreach campaign, targeting faculty, specifically faculty who have been reluctant to transition their course materials to increase the number of OER courses offered. In addition, a separate outreach campaign will be initiated targeting students. Based on the survey results, students truly appreciate OER not only for the cost savings but for the accessibility and ease of use around the materials. However, students generally are not aware of what OER is until they just "happen" to register for an OER class. Through this campaign, YC will educate students about OER and the advantages of taking a class with OER materials.

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