

ORIGINAL RESEARCH ARTICLE

University students and faculty have positive perceptions of open/ alternative resources and their utilization in a textbook replacement initiative

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(Received 30 September 2015; final version received 6 May 2016)

This is contribution no. 16-114-J from the Kansas Agricultural Experiment Station.

The Kansas State University Open/Alternative Textbook Initiative provides grants to faculty members to replace textbooks with open/alternative educational resources (OAERs) that are available at no cost to students. Open educational resources are available for anyone to access, while alternative educational resources are not open. The objective of this study was to determine the perceptions towards OAERs and the initiative, of students enrolled in, and faculty members teaching, courses using OAERs. A survey was sent out to 2,074 students in 13 courses using the OAERs. A total of 524 (25.3%) students completed the survey and a faculty member from each of the 13 courses using OAERs was interviewed. Students rated the OAERs as good quality, preferred using them instead of buying textbooks for their courses, and agreed that they would like OAERs used in other courses. Faculty felt that student learning was somewhat better and it was somewhat easier to teach using OAERs than when they used the traditional textbooks. Nearly all faculty members preferred teaching with OAERs and planned to continue to do so after the funding period. These results, combined with the tremendous savings to students, support the continued funding of the initiative and similar approaches at other institutions.

Keywords: e-textbook; college; open educational resources; Kansas State; open textbook

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Introduction

Textbooks are a big expense for college students, it is estimated that the average student spends \$1,200 on books and supplies each year (The College Board 2015). To combat this, there are multiple initiatives aimed at replacing textbooks with

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open/alternative educational resources (OAERs) at the institutional (Bell 2012; Billings *et al.* 2012; Oberlander 2015; Sutton and Chadwell 2014) and system levels (Caswell 2012). There are also a number of more focused initiatives/projects that have replaced textbooks in a course or similar courses (Bliss *et al.* 2013a, 2013b; Feldstein *et al.* 2012; Hilton *et al.* 2013; Morris-Babb and Henderson 2011; Petrides 2011; Watson, Clouser, and Domizi 2014). Open educational resources are 'educational materials that are either (1) licensed under an open copyright license (e.g., Creative Commons), or (2) in the public domain (Wiley and Green 2012)'. Open education resources (OERs) can be accessed for free and revised, reused, remixed and redistributed by others (Wiley and Green 2012). While OERs have tremendous potential to replace textbooks, there are not always OERs suitable for replacing textbooks, and faculty may not be able to find relevant open content to utilize. Non-open resources that are used to replace textbooks are referred to as alternative educational resources. Alternative educational resources may be licensed or copyrighted, or have not been made openly available. The term resource is used because the resources may not be a text, and could have different formats or mediums than the textbook they replaced.

To provide support for replacing textbooks, there are a number of initiatives that provide grants to faculty members to replace textbooks with OAERs that students can use for free. The Alternative Textbook Project at Temple University provides grants up to \$1,000 (Bell 2012), and The Open Education Initiative at the University of Massachusetts at Amherst provides grants of \$1,000–2,500 for faculty members to replace textbooks with OAERs (Billings *et al.* 2012). While these initiatives have been successful in attracting faculty to adopt, adapt, or create OAERs, they have been less successful in reaching high-enrollment, lower level courses that would benefit the most students. Faculty members at the University of Massachusetts indicated that this may be because faculty in high-enrollment, lower level courses want larger grants to make a change (Billings *et al.* 2012).

At Kansas State University, 2 faculty members, who had created and used OERs and advocated for their use on campus, collaborated with a Libraries' faculty member to pursue funding to start an initiative similar to those at Temple University and the University of Massachusetts during the 2013–2014 academic year. Kansas State Libraries committed \$10,000, and a proposal funded by the student government association awarded \$50,000 to be used to provide grants of up to \$5,000 for faculty members to replace their textbook with an OAER that was available at no cost to students. Requests for applications to the initiative were sent out in the 2013–2014 Fall and Spring semesters through a university newsletter and email announcements. Fourteen applications were received, 12 were funded. Awardees received half their award up front, the other half was awarded when they began teaching with their OAER instead of a textbook. Awardees met once with an initiative faculty member to discuss their vision for the resource, and to establish a timeline for completing it. In the latter part of the Spring 2014 semester, there was a meeting of all the awardees to discuss their experience with the initiative up to that point in time. For those who had not completed their resources over the summer, an initiative faculty member followed up with awardees, in person and through email.

While some faculty members taught with OAERs during the 2013–2014 academic year, all awardees taught with their OAERs during the Fall 2014 semester. There were a variety of resources used, including adapting or adopting an open textbook, compiling resources on the University's learning management system, writing an

online text for the course, and producing video-centered resources. The design of two awardees' collaboratively developed e-texts has been described recently (Rhodes and Rozell 2015). An estimated 4,231 students enrolled in courses using OAERs during the 2014–2015 academic year, saving these students approximately \$415,000. The savings were calculated using the actual cost for texts that were priced below \$100, and an average cost of \$100 for textbooks when the new cost exceeded \$100. This corrected calculation was used to give a more realistic estimate of savings that accounted for renting, buying used textbooks, and purchasing access codes for e-textbooks instead of purchasing a new textbook.

Community college students have found OAERs to be high quality (Bliss *et al.* 2013a, 2013b; Caswell 2012), and something that they would like to continue using (Petrides 2011). Despite a number of similar initiatives at 4-year institutions, there are limited data regarding students' perceptions on taking a course, and faculty members' perception on teaching, with OAERs instead of textbooks. The lack of data from current initiatives may be limiting their impact and preventing institutions without similar initiatives from undertaking them.

Methods

Student survey administration

During the latter part of the Fall 2014 semester, email addresses of students enrolled in courses using OAERs were collected, and a course specific link to an anonymous survey in K-State Survey (Qualtrics, Provo, UT) was emailed to students enrolled in each course. The courses, enrollments, response rates, and a brief resource description are summarized in Table 1. The email content was the same for each course except that the instructors helped develop a description of the OAERs used in course for the email. The intent of the description was to assist students in understanding what they were asked to complete a survey about. The survey was available for 2.5 weeks, with weekly email reminders sent to students. Instructors were encouraged to make their students aware of the survey, and were sent survey completion rates for their course, and other initiative courses when reminder emails were sent out. This was done to inform them of their students' completion rates compared with students in other courses.

Survey

Branching logic was used in the survey; survey questions can be found in the supplementary material. All students were asked about how frequently they used the OAERs during the semester using a 7-point Likert scale. If they answered never, they were directed to a question asking why they did not use the OAER. Students that indicated that they used OAERs were directed to 5 Likert scale questions asking about their perceptions and use of the OAERs. All students were then directed to 3 Likert scale questions asking whether they would like to enroll in courses that use OAERs, and whether they supported continued funding for the Open/Alternative Textbook Initiative. Finally, there were two open-ended questions asking why they supported, or did not support, the Open/Alternative Textbook Initiative and other similar textbook replacement initiatives/programs. The second question asked why they supported, or did not support, use of donor or University monies to fund the

Table 1. Courses, enrollments, response rates, and resource description.

Course	Enrollment	Responses (%)	Resource
BIOL 198 – Principles of Biology	744	153 (20.6)	Open, adapted OpenStax Resource (CC By 4.0)
BIOL 340 – Human Body	139	49 (35.3)	Alternative, produced in iBooks
CHM 371 – Chemical Analysis	41	10 (24.4)	Open, already available
EDCEP 851 – Multicultural Aspects of Academic Advising (Global Campus)	60	37 (61.7)	Alternative, produced in Microsoft Word
EDEL 320 – Core Teaching Skills and Lab	89	26 (29.2)	Alternative, produced in iBooks
EDSEC 376 – Core Teaching Skills and Field Experience/Lab	44	20 (45.5)	Alternative, produced in iBooks
EDSP 324 – Exceptional Child in the Regular Classroom	41	17 (41.5)	Alternative, modules of resources in learning management system
IMSE 201 – Introduction to Industrial Engineering	90	29 (32.2)	Alternative, produced in Microsoft Word
MATH 100 – College Algebra Studio	25	8 (32.0)	Open, already available book used, problem sets produced
MATH 100 – College Algebra (Global Campus)	381	67 (17.6)	Alternative, videos/website
MATH 150 – Plane Trigonometry	183	38 (20.8)	Alternative, produced in LaTeX
MC 180 – Fundamentals of Public Relations	191	46 (24.1)	Alternative, videos/content
PSYCH 470 – Psychobiology	46	24 (52.2)	Alternative, produced in Microsoft Word

Open/Alternative Textbook Initiative. Answers to non-open-ended questions were required to submit the survey. For open-ended questions, responses were categorized based on answer themes, some answers were categorized multiple times because they had multiple relevant themes.

Faculty interview administration

Open/Alternative Textbook Initiative faculty awardees were emailed to explain the purpose of the interview, and requested to indicate their availability to be interviewed. Reminder emails were sent to awardees until times were scheduled with at least one faculty awardee from all 13 courses. Interviews were conducted by a graduate student not associated with the initiative (N.D.), in person or via video conferencing, and were recorded; with the exception of one interview, which was transcribed. During interviews, faculty were encouraged to add comments or context where they felt appropriate. Interviews were conducted during a 2-month period, during Summer 2015. Results from interviews were coded and collated to protect the anonymity of awardees before sharing with coauthors associated with the initiative. For open-ended questions, responses were categorized based on answer themes, some answers were categorized multiple times because they had multiple relevant themes.

Faculty interview questions

Faculty interview questions can be found in supplementary material. Faculty were initially asked about the student experience in their courses using their OAERs, followed by questions focusing on their experience using the OAERs. Survey questions consisted of 7-point Likert scale questions, and 11 open-ended questions, 3 of which had prompted examples.

Data analysis

Descriptive statistics (means ± standard error of the mean) and percentages were calculated from student and faculty Likert question responses. Individual response scores were compared to mean course response scores, to determine whether the larger courses were skewing outcomes. The means calculated from mean course responses and the individual responses were nearly identical, so individual response means are presented. Due to the breadth of OERs and a wide variety of experiences from faculty utilizing them, qualitative data have been included from interviews, and individual level data is presented. The final 3 Likert scale survey questions from student surveys were analyzed by student’s *t*-tests using SAS 9.3 (SAS Institute Inc., Cary, NC) with $p < 0.05$ considered significant.

Results

Student survey results

The survey was sent to 2,074 students in 13 courses using the OAERs. In total, 524 (25.3%) students completed the survey.

Frequency of use

Students indicated that they used the OAERs on a weekly basis (Table 2). Interestingly, this score (4.7) aligns well with a similar question on a survey of

Table 2. Frequency of use and student support for open/alternative educational resources and the Open/Alternative Textbook Initiative (mean ± SEM).

Question	All (<i>n</i> = 524)	Used (<i>n</i> = 471)	Did not use (<i>n</i> = 53)
How frequently have you used the open/alternative resource this semester (1 = Never, 7 = More than 3 times a week).	4.8 ± 0.1	5.2 ± 0.1	1
I would like open/alternative resources used in other courses that I take (1 = Strongly disagree, 7 = Strongly agree).	5.6 ± 0.1	5.7 ± 0.1	4.6 ± 0.3*
Continued funds should be provided for the Kansas State University Open/Alternative Textbook Initiative (1 = Strongly disagree, 7 = Strongly agree).	6.0 ± 0.1	6.1 ± 0.1	4.6 ± 0.2*
I support donor or University funds being used to support the Kansas State University Open/Alternative Textbook Initiative (1 = Strongly disagree, 7 = Strongly agree).	5.8 ± 0.1	5.9 ± 0.1	4.8 ± 0.2*

* $p < 0.001$ vs. Used.

campus students done previously using an OER in a course at the same institution (4.8) (Lindshield and Adhikari 2013).

Fifty-three students (10.1%) indicated that they never used OAERs. It is worth noting that 30 (56.6%) of these students were in a large mathematics course, in which 44% of survey respondents indicated that they never used the OAER. That course created online problem sets and adopted an open textbook to support what was taught in class, and thus, some students may not have understood that the problem sets were part of the OAER.

Among the students that answered never, 38 (71.7%) answered the open-ended question about why they did not use OAERs. Sixteen (42.1%) students indicated that they did not know about the OAER or know where to find it; 16 (42.1%) students indicated that they did not need, did not think to use, or that the subject matter was taught differently than the OAER; and 3 (7.9%) students indicated that they thought or heard that the OAER was poor quality or was hard to understand. Two (5.2%) students mentioned using the OAER in their explanations, so they must not have understood the first question. One (2.6%) student indicated that the OAER was inconvenient to access.

Preference of OAERs

Students indicated that they were somewhat satisfied taking courses using OAERs and used them somewhat more to more than a normal textbook (Table 3). Students rated the OAERs as good quality and indicated that they were somewhat easy to use. Students agreed that they preferred using OAERs instead of buying textbooks for their courses. It is interesting to note that these outcomes are similar to findings in a survey of students using an open educational resource in a course at this institution (Lindshield and Adhikari 2013).

Open/alternative resources and Open/Alternative Textbook Initiative support

Overall, students agreed that they would like OAERs used in other courses (Table 1). They also agreed that funds should be provided for the Kansas State University Open/Alternative Textbook Initiative and supported donor and university funds used to do so. Interestingly, students who used OAERs had significantly higher scores on

Table 3. Student perceptions of the open/alternative educational resource using a 7-point Likert scale (mean \pm SEM).

Question	Used (n = 471)
Rate your level of satisfaction of taking this course using an open/alternative resource (1 = Completely dissatisfied, 7 = Completely satisfied).	4.8 \pm 0.1
Compared to your experience with normal textbooks, I use the open/alternative resource: (1 = Much less, 7 = Much more)	5.5 \pm 0.1
Rate the level of quality of the open/alternative resource (1 = Very bad, 7 = Very good).	5.7 \pm 0.1
Rate the level of difficulty of using the open/alternative resource (1 = Very difficult, 7 = Very easy).	5.3 \pm 0.1
I prefer using the open/alternative educational resource instead of buying a textbook for this course (1 = Strongly disagree, 7 = Strongly agree).	5.7 \pm 0.1

these questions than students who did not use them ($p < 0.001$). While students that did not use the OAERs were still supportive, they were significantly less supportive than those who did use OAERs.

Reason for supporting or not supporting the Open/Alternative Textbook Initiative

Given the differences in student responses to the previous three questions, responses to the open-ended questions were analyzed separately for students who used and did not use the OAERs. Among students that used the OAERs, 313 (66.5%) answered the first question asking why they supported or did not support the initiative. Of these, 194 (62%) students indicated they were supportive because of financial benefit, 72 (23%) students were supportive because OAERs were easy to access, and 59 (18.8%) students valued that OAERs were customized to the course. It is worth noting that 2 of the 13 courses (15.4%) did not use customized resources. If all had used customized resources then the number of students that indicated this as a reason for being supportive likely would have been higher. Twenty-six (8.3%) students liked not having to carry around the textbook or having a heavy book bag, and 10 (3.2%) students were supportive because they felt that the OAERs were more interactive than traditional textbooks. It was interesting that students valued this factor because only a limited number of the resources are active or interactive. Ten (3.2%) students were supportive because it was easy to find content in OAERs, while 9 (2.9%) students liked that the resources were online. Eight (2.6%) students valued that OAERs conserved resources, or were better for the environment.

Among students that used the OAERs but were not supportive of the initiative, 19 (6.1%) students indicated wanting a physical book/hard copy. Nine (2.9%) students liked features of the OAERs, but did not like screen reading and preferred having a physical book or copy. Seven (2.2%) students were not supportive because they did not like the OAERs or had problems using them, and 5 (1.6%) students did not think the OAERs were as good of quality as a traditional textbook. Four (1.3%) students were cautious about supporting the initiative because they wanted university funds to be used for other projects, were concerned about whether it would be successful in other courses, or wanted to make sure that the resource would be of equivalent quality to the OAER in their current course.

Among students that did not use OAERs, 35 (66%) provided an answer to this open-ended question. Among these, 11 (31.4%) were supportive of the initiative because of the financial benefit, and 2 (5.7%) students were supportive because they thought it was a good idea. One (2.9%) student was supportive, but wanted the OAERs customized to the course; another student (2.9%) was supportive because he/she liked having an online book. One student (2.9%) liked not having a heavy book bag, another student (2.9%) was supportive because of the environmental benefit. Four (11.4%) students felt neutrally because they either did not need the OAERs, or were torn between financial benefit versus wanting a physical book. Two (5.7%) students were not supportive because they wanted a physical book, another 2 (5.7%) students were not supportive because the OAERs were poor quality, and 1 (2.9%) student was not supportive because he/she thought the initiative took away learning opportunities.

The last open-ended question asked why students did or did not support donor or university funds being used for the Open/Alternative Textbook Initiative. Because all reasons that students were supportive of the initiative were gathered in the previous

question, the focus was on categorizing responses related to funds used to support the initiative. Fifty percent (263) of the students provided a response to the open-ended question that did more than direct the reader to their answer to the previous question. Eighty (30.4%) students thought the initiative was a productive use of donor and/or university funds. Seventy (26.6%) students did not specifically identify which funds they supported using, but indicated they were supportive because of the financial benefit to students. Nineteen (7.2%) students indicated donor funds, or funds not coming from students/university, should be used to support the initiative. Ten (3.8%) students thought that donor and university funds could be used for better purposes than the Open/Alternative Textbook Initiative; one (0.4%) student thought that the program would attract students to the university and another student (0.4%) supported university funds being used, but wanted donor funds used for scholarships or other earmarked purposes.

Faculty perceptions of student use and experience with open/alternative resources

Faculty indicated that they perceived that students liked OAERs better (4/13), that students had course materials in class more often (3/13), that students read the resource more closely, more often, or knew content more broadly (6/13), and that students were able to better access video, web links, and blogs relevant to the course with the OAERs compared with traditional textbooks (3/13). Four out of 13 indicated that they did not perceive a difference.

Faculty answered that student performance using the OAERs was neutral to somewhat better. Of those that did not see improved performance with the OAERs, large class size (2/13), or lack of data (1/13) were the most commonly cited reasons. Faculty who felt that performance was better cited customized content (2/13), more flexibility in course structure (faculty could change the OAER to reflect lecture material and vice-versa) (4/13), or enhanced grasp of complex concepts due to the ability to include video, websites, or audio (2/13).

Faculty also felt that student learning was somewhat better using OAERs than when they used traditional textbooks. Reasons they believed learning was improved were that OAERs were more up to date (6/13), or that faculty felt confident referring students to the OAERs to learn outside of class time (3/13). One instructor felt that their resource did not enhance student learning because the OAER was too in depth for the course content. Faculty believed that the student experience was better than with a traditional textbook, which they attributed OAERs' easy access (6/13) and customization (3/13).

Most faculty did not perceive a difference in students' perception of the course, or the instructor using the OAERs compared to when it was taught with a traditional textbook (8/13). Faculty who did note differences indicated that students connected to the instructor better because of the content (1/13, the faculty member felt that they were humanized due to the content presented); that students connected better to the content (5/13); or that students were able to connect to more complex or broad concepts either within, or outside of course structure, due to the content (2/13). One faculty member noted that students did not change their perception of the course with the OAER, but that it may have been due to the fact that students were not enthusiastic about the course.

Table 4. Faculty interview responses to 7-point Likert scale questions (mean ± SEM).

Question	Average score
How did student performance in the course using the open/alternative resource compare to a traditional textbook (1 = Much Worse, 7 = Much Better)?	4.5 ± 0.3
How did you perceive student learning in the course taught the open/alternative resource compares to the course taught using a traditional textbook (1 = Much Worse, 7 = Much Better)?	4.8 ± 0.4
How did the student experience in the course using the open/alternative resource compare to a traditional textbook (1 = Much Worse, 7 = Much Better)?	5.9 ± 0.3
How would rate the level of ease/difficulty in creating/adopting/adapting the open/alternative resource (1 = Very difficult, 7 = Very easy)?	3.6 ± 0.5
How would you rate the amount of time it took you to create/adopt/adapt the open/alternative resource compared to what you thought it would take before you did so (1 = Much Less, 7 = Much More)?	4.7 ± 0.4
How would rate the level of ease/difficulty in teaching with the open/alternative resource compared to teaching with a traditional textbook? (1 = Very difficult, 7 = Very easy)?	5.3 ± 0.3
How would you rate your experience in the Open/Alternative Textbook Initiative (1 = Very bad, 7 Very Good)?	6.5 ± 0.2

Faculty experiences creating/adopting open/alternative resources

Faculty felt that creating, adopting, or adapting their OAER was somewhat difficult (Table 4). Some of those who felt that the resource creation or adoption was somewhat to very difficult noted that they needed or acquired special knowledge to develop the resource (4/13). It is worth noting that all of these faculty members created OAERs. Other issues faculty encountered included questions about copyright or licensing of materials, and difficulty accessing materials to use in the resource (3/13). Faculty members (6/13) felt that the time required to develop the resource contributed to the difficulty of the process and indicated that it took somewhat more time than they anticipated to create, adopt, or adapt their OAERs.

Faculty felt it was somewhat easier to teach with OAERs compared to a traditional textbook. Reasons provided included customization and enhanced applicability to the course (5/13), ease of supplementing lecture content with the resource (2/13), improved course organization (1/13), and decreased financial reasons for not having access to materials allowing for full utilization of the resource, and thus enhanced ease of teaching (1/13).

Utilization and continuance

Nearly all (12/13) faculty members indicated that they preferred teaching their course with the OAERs instead of a traditional textbook. Several (11/13) indicated that customization was a reason for this preference. Other reasons included easier format to use (2/13), flexibility in teaching content (5/13), ability to collaborate with other instructors more seamlessly (1/13), ease of teaching (1/13), and congruency in learning materials (faculty and text) (1/13). The faculty member who indicated not preferring the OAERs indicated that he/she liked the OAER, but felt that a traditional textbook was just as, or easier to use. The primary reason for preferring a traditional text was that he/she had taught the course for many years, refining it over time, and so it was

not difficult to teach with the textbook. This was the only awardee that did not plan to utilize the OAER in the future.

Similar to preference, nearly all (12/13) faculty members planned to continue using OAERs beyond the funding period. Several (6/13) indicated that this was due to adaptability of materials that they had created over time, while customization (5/13), and flexibility (4/13) in teaching content were the next most highly cited reasons. Two respondents indicated that they felt OAERs enhanced the overall class experience. The respondent who did not plan to continue to utilize the resource indicated that it was because they did not plan to teach the course in the future. That faculty member indicated that had they continued to teach the course, they would have likely used the OAER. Reasons motivating faculty to use OAERs included financial benefit to students (12/13), financial support from the initiative (9/13), consistency with their teaching philosophy (8/13), lack of suitable materials for the course (6/13), customization of resource to teaching (6/13), and 1 respondent noted that this idea directly coincided with professional development goals.

Challenges, resources, and post-initiative perspective

The most frequently cited challenges in creating, adopting, or adapting OAERs were time required (6/13), technology issues (6/13), and concerns about copyright/licensing (4/13). One faculty member stated that it was difficult to coordinate the use of the OAER with other faculty teaching their course, and that the work was somewhat tedious. Others said that it was difficult to create an innovative resource (1/13), or that it was difficult to get students to use the resource (1/13). Two faculty cited no problems or challenges in creating their OAERs.

When asked what areas of support would have helped faculty when creating their OAERs, several faculty (8/13) indicated that more credit for development, or consideration of development of OAERs in tenure or professional advancement would have been important to them. Faculty (7/13) also felt that more support from the department, college, or university as a whole (most often department heads), and support from peers using OAERs would have been valuable (6/13). Faculty also noted that more training (5/13), time (3/13), or financial resources (3/13) would have enhanced their project. Two faculty members did not feel that they needed additional support from the initiative.

Faculty indicated that if they could go back through the initiative again, they would have wanted to know about overall availability of platforms to create and adopt OAERs and best sources to obtain content from (4/13). Additionally, technological or authoring assistance during the process of creating their resources (3/13), and more support with copyright or licensing issues (2/13) would have been helpful. Others noted that they would have liked to have a better idea of the amount of time to create the OAER (2/13). One faculty member noted that he/she would have liked to have known about opportunities to collaborate before undertaking the project, and another stated that they would have liked to have known that students in his/her course were likely to print the materials rather than use them electronically.

Faculty experiences with the initiative itself

Overwhelmingly, faculty indicated that they had a good to very good experience in the Open/Alternative Textbook Initiative (Table 4). Faculty appreciated that the

initiative was transparent, and ‘said it was going to do what it did’ (7/13). Some faculty (4/13) reported that they enjoyed the process of creating their OAER, a few (2/13) enjoyed receiving the award, or appreciated that the initiative prompted college or departmental change (2/13). One said that students liked the OAER better, and thus had a good experience with the initiative. The faculty member who rated their experience as somewhat good noted that challenges included a somewhat disorganized start to the initiative, and that they did not quite understand what an OAER could really be.

When asked about ideas that could encourage more faculty to create, adopt, or adapt OAERs, faculty (7/13) answered that OAERs would be better adopted if faculty had an idea of what peers had done before. Training, financial support, and time beyond the funding period or reduced teaching load were also mentioned (3/13). Two faculty proposed directly targeting large lecture classes where the most financial benefit could be gained, and another two noted enhanced use of accolades, including tenure considerations and promotion would likely support further initiative growth. One faculty member stated that collaborating with other faculty could be helpful to reduce the work load to individual awardees.

Overall, 7/13 faculty independently responded that they endorsed university wide support or expansion of the project. Three other faculty members indicated that although their overall experiences were positive, the project was either time consuming (2/13) or that they needed a reduced work load to create their resource (1/13).

Discussion

To the best of our knowledge, this manuscript is the first to assess both student and faculty perceptions at a 4-year institution where an initiative replaces textbooks with OAERs. While a higher survey completion rate would have been desirable, the completion rate was towards the top of the range (5.9–33%) reported for online surveys of other initiatives (Bliss *et al.* 2013a; Feldstein *et al.* 2012). Overall, the findings indicate that students and faculty had positive experiences in courses that used OAERs, which is similar to mathematics students at a community college using an open educational resource (Hilton *et al.* 2013). Salient findings that may interest institutions adopting OAERs have been summarized in Table 5.

The frequency that students reported using the OAERs was similar to 2–3 times per week that community college students in Project Kaleidoscope reported

Table 5. Initiative findings and practical implications for institutions adopting OAERs.

Finding	Practical relevance
1. Overall student and faculty preference	OAERs may be acceptable in a wide variety of educational settings
2. Limited student preference for physical or hard copy of material	Pushback from faculty or student preference for hard copy vs. OAER may have limited implication in practice
3. Preference for customizable nature of OAERs	Institutions promoting OAERs adoption may benefit from faculty led or course driven material development
4. Financial benefit	Institutions promoting OAERs may consider financial incentive proportional to course need
5. Preference for credit through tenure/promotion	Faculty encouraged to develop and maintain OAERs may be incentivized by institutional support by way of promotion and tenure credit

(Bliss *et al.* 2013a). Students' preference for the OAERs over traditional textbook is similar to business students indicating that they preferred the content in OERs at a 4-year institution (Feldstein *et al.* 2012). It is worth pointing out that the findings from Likert questions are similar to those from a survey of students using an OER in a course at the same institution (Lindshield and Adhikari 2013). This consistency may mean that similar results may be expected to these questions on future surveys of initiative students. It is also interesting that the percentage of students that were not supportive of the initiative because they preferred a physical or hard copy was similar between students that used or did not use OAERs (~6%). Given this consistency, this may be an indication that the resistance for this reason is relatively limited.

It was also notable that faculty and students both indicated that financial benefit and customization were reasons that they supported OAERs. These results may indicate that initiatives should strive to have faculty do more than simply adopting an OAER, they should be encouraged to adapt or customize it for their course. The responses from faculty on what they wish they would have known before developing their OAER are invaluable and can help guide initiatives regarding the necessary training and resources to provide faculty awardees. The recommendations from faculty members suggest that institutional support and professional credit in tenure and promotion would spur more faculty adopting/adapting/creating OAERs.

The initiative was by and large successful in reaching larger enrollment courses, 1 of its primary goals, but it is not known how much of this was due to the larger monetary awards that were offered (as opposed to the awards offered at the University of Massachusetts or Temple University initiatives). It is also difficult to determine what the impact would be if all resources were required to be OERs. Many awardees are using alternative educational resources, some of which will hopefully become OERs eventually. Although the initiative has been fairly successful, larger monetary awards and more active recruitment, rather than simply requesting applications, may be needed to entice some large enrollment courses to replace their textbooks with OAERs as suggested by some faculty interviewees. In addition, if the initiative is scaled up, more funding will be required for administrative functions, mentoring, resource revisions and updates, and training to support its continued success. It is important to note some of the limitations of this research. This research was conducted at a single institution using a survey that has not been validated. While the survey response rate was higher than some other surveys of students in similar initiatives, we cannot rule out the potential that the students who responded had a better experience and/or were more supportive of the initiative than those who did not. It is also important to note that there was a time difference between when the surveys were administered to students and when faculty interviews were conducted.

In conclusion, these results combined with the tremendous savings to students, support the funding of this initiative and similar initiatives at other institutions. Further research is needed to better understand how to maximize the positive impact to students and faculty in similar initiatives.

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