

Impact of OER Material during COVID-19: Survey of Students Enrolled in City University of New York (CUNY) Kingsborough Community College

Dorina Tila*

Business Department, CUNY Kingsborough Community College

***Correspondence:** Dorina Tila, City University of New York (CUNY), Kingsborough Community College, Department of Business, 2001 Oriental Boulevard, Brooklyn, New York 11235. Email: Dorina.Tila@kbcc.cuny.edu

Citation: Tila D (2023) Impact of OER Material during COVID-19: Survey of Students Enrolled in City University of New York (CUNY) Kingsborough Community College. American J Sci Edu Re: AJSER-128.

Received Date: August 20, 2023; **Accepted Date:** September 01, 2023; **Published Date:** September 08, 2023

Abstract

What role did COVID-19 play in the students' benefits and challenges of open educational resources (OER)? Motivated by decades of research in helping students to access and use course materials to improve their learning by offering substitutes to the highly priced and exponentially increasing costs of commercially printed textbooks, this paper takes another dive to understand students' challenges and benefits of OERs during the pandemic. Based on an anonymous survey distributed to students enrolled in CUNY Kingsborough Community College (N=1,175 participants) during Fall 2020, the two top benefits reported were cost savings and access. Some challenges identified in the open and closed ended questions include the organization of the material to fit the course design of the faculty. Unlike prior surveys, students reported difficulty with accessing the OER material, but they continue recommending OER material at similar rates as prior to the pandemic.

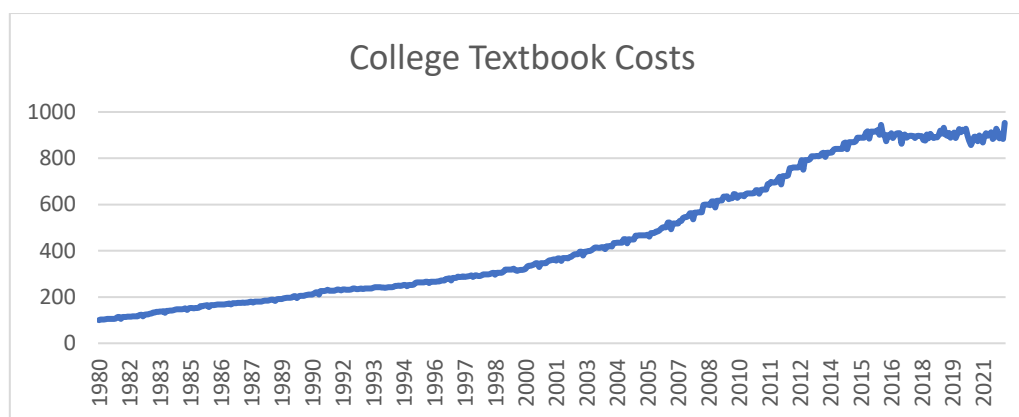
Keywords: Open Educational Resources, zero textbook cost, ZTC.

Introduction

Impact of OER Material during COVID-19: Survey of Students Enrolled in City University of New York (CUNY) Kingsborough Community College. An increase in textbook costs has been a source of discussion, especially in the last decade, due to its perceived impact on student access to course materials, course completion, and equity issues. One important evidence is the increase in college textbook costs by 9.5-fold compared to 1980, as calculated by using the data collected from Bureau Labor Statistics (BLS) and shown in Figure 1. During

this same period, the Consumer Price Index (CPI), which represents the average cost of a basket of goods and services that a typical average consumer purchases annually, has increased 3.65-fold as per the BLS CPI Inflation Calculator. This means that, if the average cost of living is 3.65 times more in February 2022 compared to January 1980, the cost of college textbook is 9 times more. While the CPI shows an increase in the cost of living due to inflation, the college textbook index shows a significantly higher increase in the textbook cost, making textbooks relatively more expensive to other consumer products over time.

Figure 1: College Textbook Costs Index from 1980 to 2021,



Note. Data is retrieved from Bureau Labor Statistics for college textbook costs. 1980 is considered the base year and the index is set at 100. In February 2022, the index is 952, reflecting an increase in the textbook cost by 9.5 times. BLS data source on PCU511130511130F21 <https://download.bls.gov/pub/time.series/pc/pc.data.53.Publishing>

Data suggests that such high rising costs have been affecting students' choices and academic performance. Based on Nagle and Vitez study in 2020 [1], an anonymous survey conducted during Fall 2019 and distributed to 83 campuses across 19 states

and Washington DC, enabling participation of over 500,000 students, unfolded the expected negative effects of the increasing costs of textbooks. Among these findings, 63 percent of the respondents reported skipping buying the textbook,

compared to 65 percent in the 2014 survey. This increase, despite being small, shows that students are continuing to face challenges with textbook costs. About 90 percent of the responding students reported awareness of the negative impact that lack of access to a textbook has on the coursework completion and grade. And yet, such a decision is guided in the need of substituting textbook with other competing goods and services, such as food, utilities, etc. Additionally, 11 percent of the respondents reported skipping meals, while 25 percent reported working extra hours to be able to cover the course material costs. Furthermore, such high course material costs might have an impact on a student's decision not only ex post of enrolling in the class, but also ex ante. In this survey, 19 percent of the respondents reported on selecting enrollment in a course section based on the textbook cost [1].

From an economist perspective, when the price of a product increases, the demand for its substitute will increase. For example, we have witnessed the demand increase for public transportation or carpooling in response to an increase in fuel prices. Similarly, the law of demand and interactions of related products would apply to textbooks and course materials as well. Similar products that would best substitute the commercially printed textbooks are the Open Educational Resources (OERs) which are free of use. The Hewlett Foundation defines OER as "teaching, learning, and research resources that reside in the public domain or have been released under the intellectual property license that permits their free use and re-purposing by others". Such substitute to commercially printed textbooks has built momentum both in its adoption by faculty and in its focus of research aiming at measuring the benefits and challenges from an objective perspective by using students' actual performance, as well as subjective perspective by using faculty and students' perception on their experience of using OER materials.

The use of OER materials in lieu of commercially printed textbooks will minimize the cost associated with course material and increase students' access. Empirical research has shown that adoption of OER materials have provided no statistical difference in student performance compared to students enrolled in courses that did not adopt OER material [2-10]. Other empirical studies showed that students enrolled in courses that adopted OER material performed better and had lower withdrawal rates [11-18]. Furthermore, faculty and students' perception of the efficacy, use, and access of OER material has been consistently and continuously positive. Several studies focused on faculty perceptions have found that faculty reported the belief that OER material's quality is the same or better than the traditional textbooks at about 90% rate in a survey reported

by Bliss et al. (2013a and 2013b) [19,20] and 87.8% in Babson Survey by Allen and Seaman (2014) [21]. Similar studies captured students' perception about OER course materials. For example, 87% of students reported the perception that quality of OER materials were better or the same as reported by Illowsky, Hilton, Whiting, and Ackerman (2016) [22]. Cooney (2017) [23] found a higher rate of 96% of students, while 94% of students was reported by Ikahihifo, Spring, Rosencrans and Watson (2017) [24], and 86% of students was reported by Abramovich and McBride (2018) [25].

This abundance of empirical studies existed prior to COVID-19. This paper will share some of the students' perception of the benefits and challenges of using OER material in the courses they were enrolled in during Fall 2020 at one of the community colleges of City University of New York (CUNY). The pandemic has created a situation like never before when most courses were shifted into emergency remote teaching. Such circumstances of high unemployment, high insecurity of future streams of income, high stress levels, social distance, and increasing costs of textbooks have created a fertile ground for the growth and demand of free and easily accessible course materials. The use of OER materials might be even more imperative during such situations.

This paper aims to inquire and compare students' experiences before and during the pandemic. The findings show that students' challenges with textbooks costs and their perception of OER benefits has not changed when compared to other studies and surveys completed before the pandemic. Students' feedback also shows that there is still room for improvement in adopting OER materials (e.g., printing, annotation, design and organize the material), which will be discussed in the last section of this article.

Method

The data has been collected through an anonymous Qualtrics survey distributed via email and text to all full time and part time students enrolled at Kingsborough Community College during Fall 2020. The survey was prepared by a group of faculty members of the Using Data to Support Teaching and Learning Faculty Interest Group in collaboration with the Office of Institutional Effectiveness. The research project was approved as exempt by the City University of New York Institutional Review Boards (IRB). The survey included 22 questions relating to the students' experience and challenges with remote learning during Fall 2020. Five of these questions that are shown in Table 1 relate to the course material, which are the items of analysis for this article.

Table 1: Five OER-Relevant Questions Extracted from the Survey.

Questions
Q8: What difficulties did you have regarding course materials, like textbooks and readings, during Fall 2020? (Check all that apply)
Q9: Did you have at least one course that offered all the materials at zero cost (for free)?
Q10: Compared to most other courses you have taken how would you rate access to the zero-cost materials for this course?
Q11: Would you recommend a course using "zero-cost" materials?
Q12: What were the benefits or challenges of the open/free materials used in this course?

These course material relevant questions refer to open access material or zero-cost material that are used in course designations by CUNY to indicate when courses do not require students to purchase reading course materials. In these “Zero Textbook Cost” or ZTC courses, faculty may provide various options of assigned reading materials, such as OER as well as other materials that may not be open but are accessible free of charge for students through the school’s library subscriptions (CUNY website).

Results

Perception of Students enrolled in at least one ZTC course

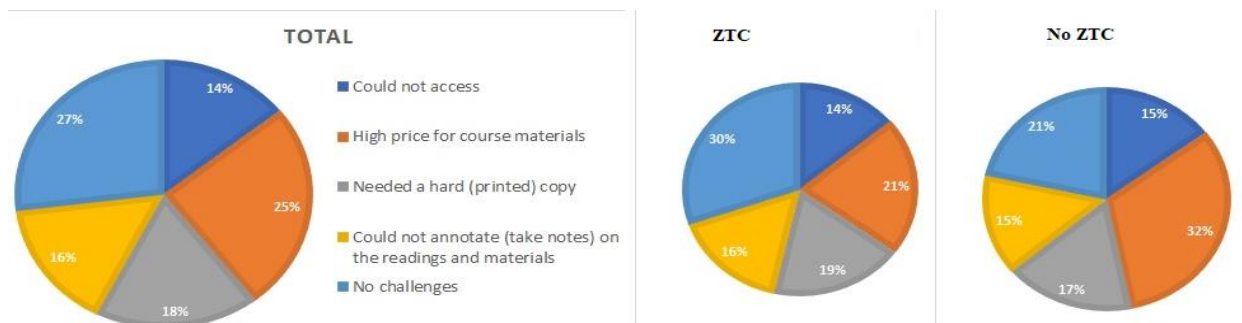
The anonymous survey was distributed to all KCC students by the end of Fall 2020 semester and 1,175 students responded. Questions 8 through 12 relate to the course material used in their courses. Question 8 asks about students’ difficulties regarding the course materials, regardless of whether they were enrolled in a ZTC course. Ninety percent of all respondents (1,048 students) selected at least one factor that affected their experience with the assigned course materials, while ten percent (123 students) did not answer this question.

Furthermore, 47% of the 1,175 participants reported to have been enrolled in at least one ZTC course. Both groups, the students who reported to have been enrolled in at least one ZTC course and the ones reported to have not, have been asked about

their challenges with course material during their remote learning in Fall 2020. Table 2 shows the results of their responses and compares the experience reported by both groups. Each student was able to select more than one challenge; therefore, the total number of selections was higher than the number of participants. It is important to note that the response rate is higher for the ZTC group, whereby these students selected on average 1.58 answers compared to 0.86 reported by the other group. A higher percentage of students enrolled in at least one ZTC report no challenges with the course material. However, it is important to emphasize that the challenges regarding accessibility, printed copy, and issues with annotation are about the same in both groups. This can be explained by the online availability of commercial textbooks that seem to provide similar benefits and challenges as OER materials, except for the price advantages. However, unlike prior studies, we observed less divergence between the students’ experience and perception of these two types of course materials, OER and non OER.

Figure 2 shows that overall, 27% of the participants reported no challenges in aggregate. When the data is disaggregated between students who were enrolled in a ZTC course, a clear difference is observed, whereby 21% of the students enrolled only in courses using commercially printed textbooks reported no challenges, compared to 30% of the students enrolled in at least one ZTC course.

Figure 2: Percentage Responses Regarding Open Access Material.



Note. Out of 1,175 participants, 1,048 students reported one or more difficulties regarding course materials, like textbooks and readings, during Fall 2020. Out of these respondents, 378 reported no challenges.

After further investigation of this issue, the next question relates to the most popular challenge reported. Figure 2 and Table 2 show that 32% of the respondents who were enrolled only in courses using commercially printed textbooks identified the high price of the course materials as a challenge, compared to 21% of the students who reported to have enrolled in ZTC courses. This data confirms prior findings that high-priced

textbooks are a real challenge for the students. Note that the limitation of this study is that this data is contaminated, meaning that the students who reported to have been enrolled in ZTC courses may have also been enrolled in other courses that use commercially printed textbooks. Hence, this group might still report the cost as being a challenge, but it is significantly alleviated by enrolling in at least one ZTC course.

Table 2: Reported Difficulties of Participants Based on their Reported Experience with Zero-Cost Textbooks.

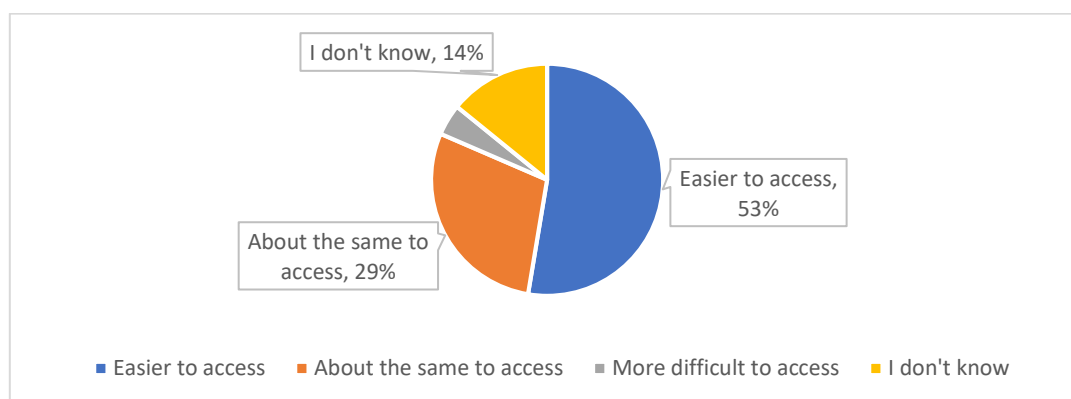
What difficulties did you have regarding course materials, like textbooks and readings, during Fall 2020?	No ZTC Course	Yes ZTC Course	Total
Could not access	15%	14%	14%
High price for course materials	32%	21%	25%
Needed a hard (printed) copy	17%	19%	18%
Could not annotate on the readings and materials	15%	16%	16%
No challenges	22%	30%	27%
Total Selections #	534	868	1,402
Total Participants #	624	551	1,175
% Selections / Participants	0.86	1.58	1.19

Note. Out of 1,175 participants, 551 reported to have been enrolled in at least one course offering zero-cost textbook and asked to compare their experience, referred to in the column “zero-cost textbook.” The other students, 624, are referred to as “No Zero-Cost Textbook.” Each student can select more than one challenge.

Perception of students enrolled in at least one ZTC course subject to demographic and gender differences

Out of 1,175 students, 551 participants reported to have been enrolled in at least one ZTC course during Fall 2020. When asked to compare their experience with OER materials offered in ZTC courses, 82 percent of these respondents provided the same or better experience when using OER material compared to commercially published textbooks as indicated by the easiness of access, shown in Figure 3.

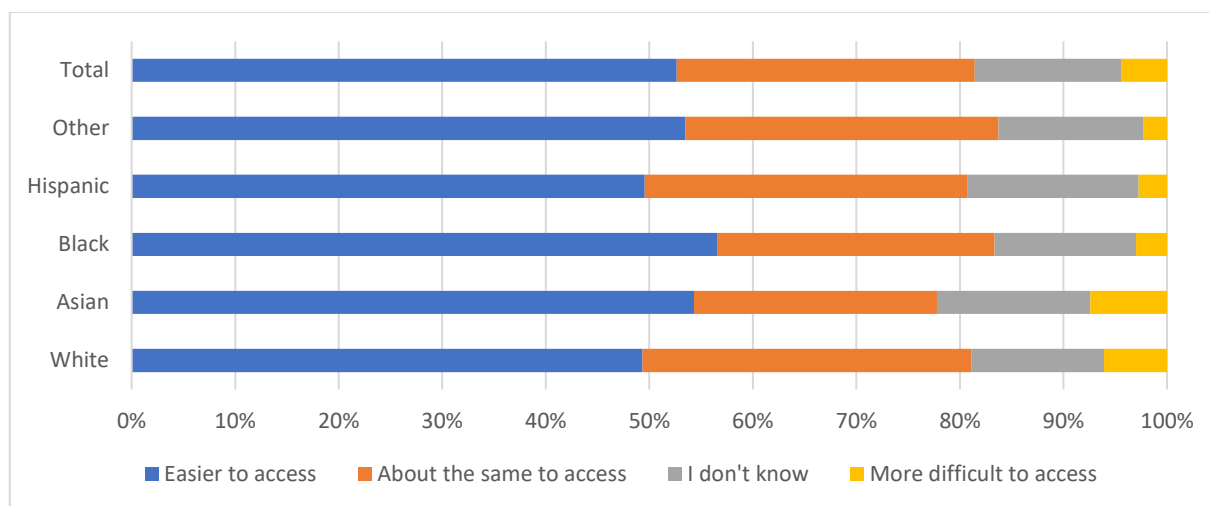
Figure 3: Percentage Responses Regarding Open Access Material.



Note. The percentage of responses are shown for 551 students out of 1175 students who reported to have been enrolled in at least one ZTC course and asked to compare their experience. 82 percent of the respondents provided a more positive experience of zero-cost textbooks compared to other options as shown by the easiness of access.

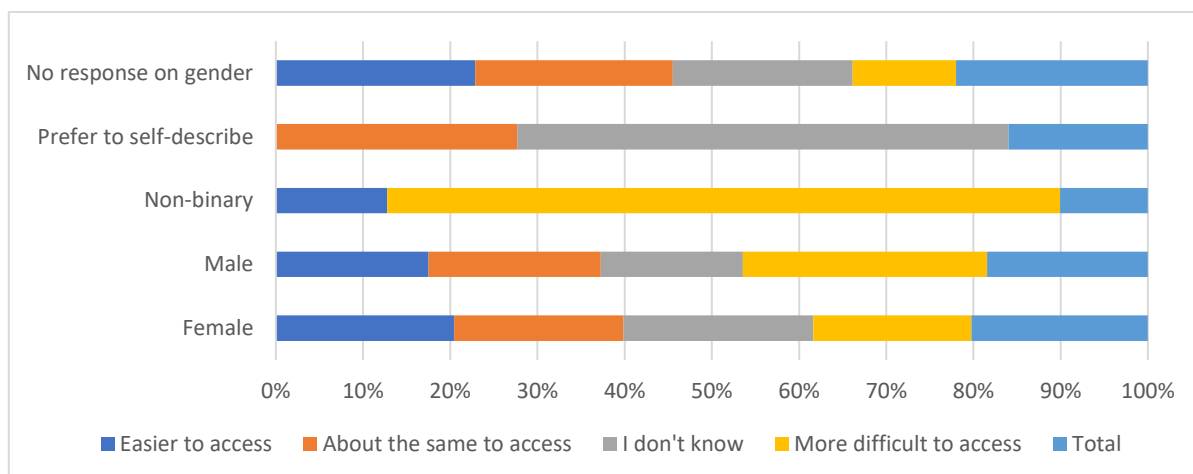
Out of 551 participants who reported to have been enrolled in at least one ZTC course in Fall 2020, 81 percent reported their race and 76 percent reported their gender. Figures 4 and 5 show that there does not seem to be any sizeable differences in ZTC course experience about book accessibility based on gender or demographics.

Figure 4: Demographics and Percentage Responses Regarding Open Access Material.



Note. Out of 551 participants who reported to have been enrolled in zero-cost textbook course in Fall 2020, 449 reported their race as White (148), Asian (81), Black (168), Hispanic (109), or Other (43). The data is combined by the race reported and the respondents’ experience with ZTC.

Figure 5: Gender and Percentage Responses Regarding Open Access Material.



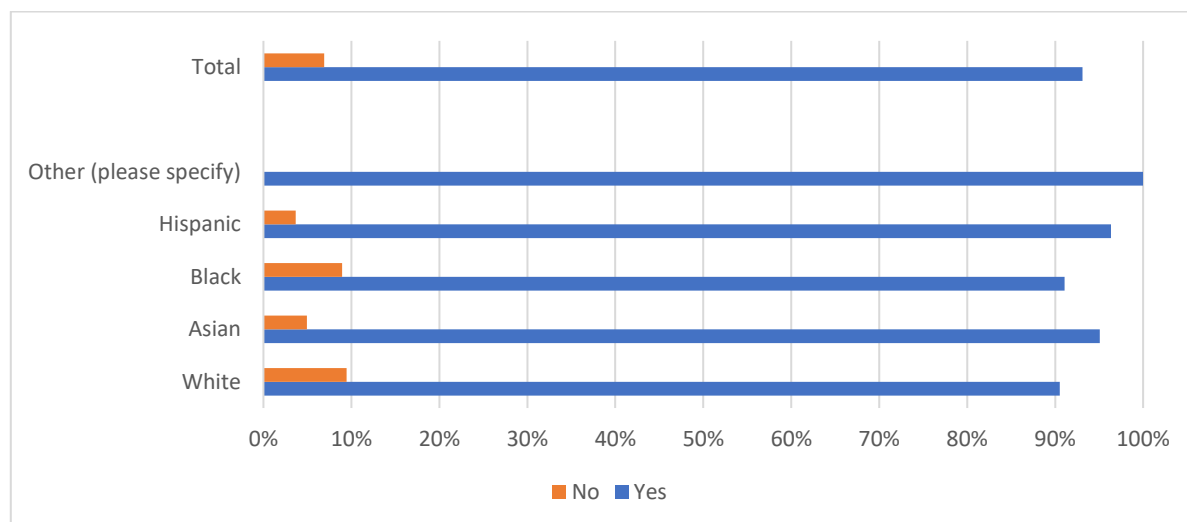
Note. Out of 551 participants who reported to have been enrolled in zero-cost textbook course in Fall 2020, selected a gender of female (282), male (136), non-binary (3), prefer to self-describe (2), or did not select any (128). The data is combined by the gender reported and the respondents' experience with a zero-cost textbook.

Future Recommendations

Participants who were enrolled in at least one ZTC course were asked whether they would recommend the use of zero-cost material. 93 percent of these students reported that they would recommend it. This high recommendation rate is like the pre-COVID results that were reported by a prior survey ran CUNY

wide. Figure 6 shows that there are no sizeable differences of the recommendation rate based on demographics. All races and genders report a recommendation rate of over 90%. The highest positive response is among Hispanic, whereby 96% report to recommend zero-cost materials used in ZTC course.

Figure 6: Recommendations for Free Access Material and Demographics.



Note. Out of 551 participants who reported to have been enrolled in zero-cost textbook course in Fall 2020, 449 reported their race as White (148), Asian (81), Black (168), Hispanic (109), or Other (43). The data is combined by the race reported and the respondents' recommendations with a zero-cost textbook.

The last question relevant to the course material is an open-ended question which allows students to write about the benefits and challenges they encountered with the zero-cost materials. After coding their comments, the top benefits reported were cost savings and easy access (about 53% and 39%, respectively), and very few challenges regarding printing and quality (about 4% each). In these open-ended questions, it is identified that many

respondents who report access challenges, were referring to course design and organization provided by the faculty rather than the material itself. Below are some examples of students' quotes which provide a good opportunity to open the discussion with faculty using such material and making sure to properly incorporate them with their course design.

Table 3: Some Reported Challenges Related to Course Design and Organization rather than Course Material.

Sample of Students Quotes
"All reading materials were available however that gave professor a reason to pile on more work"
"Benefits were that it was free but having to go through blackboard syllabus and find the book was difficult for me I rather Purchase the textbook"
"Too much material to cover in such a short time. While this is remote, I as everyone else have non-school related responsibilities. Time Mgmt. was difficult. Also, I think additional items were added due to the fact we are remote"
"The bad thing is having to keep up with a bunch of random assignments all at once, it can be hard to get in contact with other teachers and it's a lot of pressure getting through materials especially for the test."

Discussion

Would you be willing to pay less for the book? Probably, any student would like to respond yes. What role did COVID-19 play in the students' benefits and challenges of OER? Motivated by decades of research in helping students to use course materials to improve their learning in courses by offering substitutes to the highly priced and exponentially increasing costs of commercially printed textbooks, this paper takes another dive to understand students' challenges and benefits of OERs during the pandemic. An anonymous survey was conducted to students enrolled in CUNY Kingsborough Community College during the COVID-19 pandemic. The survey showed that students consider high costs of commercially printed textbook as a financial challenge and these 1,175 participants reported challenges like prior the pandemic and with the two top benefits of using OER as being cost savings and access of the materials. Some challenges that are identified in open and closed ended questions are organization of the material to fit the course design of the faculty. It is important to note that students also had difficulty with accessing the OER material, unlike prior surveys, but they continue recommending OER material at similar rates as prior to the pandemic.

Conclusions

In conclusion, this paper inquired and compared students' experience before and during the pandemic. The findings showed that students' challenges with textbooks costs and their perception of OER benefits had not changed when compared to other studies and surveys completed before the pandemic. Students' feedback also shows that there is still room for improvement in adopting OER materials (e.g., printing, annotation, design and organize the material) and, through these findings, the faculty is encouraged to continue the work on adopting OER material and carefully incorporate it during the course design. Further investigation and assessment of how OER material are used and may affect students' performance might be needed continuously to ensure that students are having access to affordable and high-quality textbook content.

Conflict of interest statement

I have no conflicts of interest to disclose.

Source of funding for the project

This project was funded by the Open Education Group Fellowship funded through the Hewlett Foundation and through PSC-CUNY Research Award for Cycle 52.

Acknowledgements

I gratefully acknowledge support from the Using Data to Support Teaching and Learning Faculty Interest Group, the Kingsborough Institutional Effectiveness, the Kingsborough

Center for Teaching and Learning (KCTL), the Kingsborough Center for e-Learning (KCeL), and the Department of Business at Kingsborough Community College.

References

1. Nagle, C. & Vitez, K. (2020). Fixing the broken textbook market. *U.S. PIRG Education Fund*. Retrieved December 12, 2021, from <https://uspig.org/feature/usp/fixing-broken-textbook-market>
2. Hilton, J., Gaudet, D., Clark, P., Robinson, J., & Wiley, D. (2013). The adoption of open educational resources by one community college math department. *The International Review of Research in Open and Distance Learning*, 14(4), 37–50. <http://www.irrodl.org/index.php/irrodl/article/view/1523/2652>
3. Ozdemir, O., & Hendricks, C. (2017). Instructor and student experiences with open textbooks, from the California open online library for education (Cool4Ed). *Journal of Computing in Higher Education*, 29(1), 98–113. <https://link.springer.com/article/10.1007/s12528-017-9138-0>
4. Lawrence and Lester (2018). Evaluating the Effectiveness of Adopting Open Educational Resources in an Introductory American Government Course. *Journal of Political Science Education*, 14 (4): 555-556. <https://doi.org/10.1080/15512169.2017.1422739>
5. Lovett, M., Meyer, O., & Thille, C. (2008). The open learning initiative: Measuring the effectiveness of the OLI statistics course in accelerating student learning. *Journal of Interactive Media in Education*, 2008 (1).
6. Wiley, D., Hilton, J. Ellington, S., and Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in middle and high school science classes. *International Review of Research in Open and Distance Learning*, 13 (3), pp. 261-276. <http://www.irrodl.org/index.php/irrodl/article/view/1153/2256>
7. Allen, G., Guzman-Alvarez, A., Smith, A., Gamage, A., Molinaro, M., & Larsen, D. S. (2015). Evaluating the effectiveness of the open-access ChemWiki resource as a replacement for traditional general chemistry textbooks. *Chemistry Education Research and Practice*, 16(4), 939–948. <https://doi.org/10.1039/C5RP00084J>
8. Croteau, E. (2017). Measures of student success with textbook transformations: The Affordable Learning Georgia Initiative. *Open Praxis*, 9(1), 93–108. <http://doi.org/10.5944/openpraxis.9.1.505>

9. Chiorescu, M. (2017). Exploring Open Educational Resources for College Algebra. *The International Review of Research in Open and Distributed Learning*, 18(4). <http://www.irrodl.org/index.php/irrodl/article/view/3003/4223>
10. Kelly, D. P., & Rutherford, T. (2017). Khan Academy as Supplemental Instruction: A Controlled Study of a Computer-Based Mathematics Intervention. *The International Review of Research in Open and Distributed Learning*, 18(4). <http://www.irrodl.org/index.php/irrodl/article/view/2984/4221>
11. Feldstein, A., Martin, M., Hudson, A., Warren, K., Hilton, J. & Wiley, D. (2010). Open Textbooks and Increased Student Access and Outcomes. *European Journal of Open, Distance and E-Learning*, 2. Retrieved December 22, 2021, from <https://www.learntechlib.org/p/73798/>
12. Gil, P., Candelas, F., Jara, C., Garcia, G., Torres, F (2013). Web-based OERs in Computer Networks. *International Journal of Engineering Education*, 29(6), 1537-1550. <https://www.ijee.ie/contents/c290613.html>
13. Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2012). Interactive Learning Online at Public Universities: Evidence from Randomized Trials. Ithaka S+R.
14. Hilton, J., & Laman, C. (2012). One college's use of an open psychology textbook. *Open Learning. The Journal of Open and Distance Learning*, 27(3), 201–217. <https://doi.org/10.1080/02680513.2012.716657>
15. Pawlyshyn, Braddlee, Casper and Miller (2013). Adopting OER: A Case Study of Cross-Institutional Collaboration and Innovation. *Educause Review*. <https://er.educause.edu/articles/2013/11/adopting-oer-a-case-study-of-crossinstitutional-collaboration-and-innovation>
16. Robinson T. J., Fischer, L., Wiley, D. A., & Hilton, J. (2014). The impact of open textbooks on secondary science learning outcomes. *Educational Researcher*, 43(7): 341-351. <https://doi.org/10.3102/0013189X14550275>
17. Wiley, D., Webb, A., Weston, S., & Tonks, D. (2017). A Preliminary Exploration of the Relationships Between Student-Created OER, Sustainability, and Students Success. *The International Review of Research in Open and Distributed Learning*, 18(4). <http://www.irrodl.org/index.php/irrodl/article/view/3022/4222>
18. Green, K., & Davis, W. P. (2017). The Impact of Enrollment in an OER Course on Student Learning Outcomes. *The International Review of Research in Open and Distributed Learning*, 18(4). <http://www.irrodl.org/index.php/irrodl/article/view/2986/4211>
19. Bliss, T., Hilton, J., Wiley, D., Thanos, K. (2013a). The cost and quality of open textbooks: Perceptions of community college faculty and students. *First Monday*, 18:1. <https://firstmonday.org/ojs/index.php/fm/article/view/3972/3383>
20. Bliss, T., Robinson, T. J., Hilton, J., & Wiley, D. (2013b). An OER COUP: College teacher and student perceptions of Open Educational Resources. *Journal of Interactive Media in Education*, 1–25.
21. Allen, I., Seaman, J. (2014). Opening the Curriculum: Open Educational Resources in U.S. Higher Education, <https://www.bayviewanalytics.com/oer.html>
22. Illowsky, B. S., Hilton III, J., Whiting, J., & Ackerman, J. D. (2016). Examining Student Perception of an Open Statistics Book. *Open Praxis*, 8(3), 265-276. <http://doi.org/10.5944/openpraxis.8.3.304>
23. Cooney, C. (2017). What Impacts do OER Have on Students? Students Share Their Experiences with a Health Psychology OER at New York City College of Technology. *The International Review of Research in Open and Distributed Learning*, 18(4). <http://www.irrodl.org/index.php/irrodl/article/view/3111/4216>
24. Ikahihifo, T. K., Spring, K. J., Rosecrans, J., & Watson, J. (2017). Assessing the Savings from Open Educational Resources on Student Academic Goals. *The International Review of Research in Open and Distributed Learning*, 18(7). <http://www.irrodl.org/index.php/irrodl/article/view/2754/4442>
25. Abramovich S., & McBride M. (2018). Open education resources and perceptions of financial value. *Internet and Higher Education*, 39: 33-38. <https://doi.org/10.1016/j.iheduc.2018.06.002>
26. Bureau of Labor Statistics. The Economics Daily, College tuition and fees increase 63 percent since January 2006. U.S. Department of Labor, Retrieved Nov 30, 2021, from <https://www.bls.gov/opub/ted/2016/college-tuition-and-fees-increase-63-percent-since-january-2006.htm>
27. Bureau of Labor Statistics. Data on college textbook costs PCU511130511130F21. U.S. Department of Labor, Retrieved December 12, 2021, from <https://download.bls.gov/pub/time.series/pc/pc.data.53>
28. City University of New York (CUNY). Zero Textbook Cost Guidelines. Retrieved December 23, 2021, from <https://www.cuny.edu/libraries/open-educational-resources/guidelines-for-zero-textbook-cost-course-designation/>
29. Creative Commons (2021). Open Education. Accessed December 22, 2021, from <https://creativecommons.org/about/program-areas/education-oer>
30. Hanson, M. (2021). Average cost of college textbooks. EducationData.org. Retrieved August 12, 2021, from <https://educationdata.org/average-cost-of-college-textbooks>
31. OpenStax (2020, August 31). *OpenStax surpasses \$1 billion in textbook savings, with wide-ranging impact on teaching, learning and student success*. Retrieved December 12, 2021, from <https://openstax.org/press/openstax-surpasses-1-billion-textbook-savings-wide-ranging-impact-teaching-learning-and-student-success>
- UNESCO. (2021). Open Education Resources (OER). Retrieved December 22, 2021, from <https://en.unesco.org/themes/building-knowledge-societies/oer>