

What students like and dislike about open textbooks

Steven Earle PhD

Open Learning Faculty Member, Thompson Rivers University

Open Education Research Fellow, BCCampus

Summary

In the fall term of 2018 students that were enrolled in a range of different courses at nine BC post-secondary institutions participated in a survey providing feedback on their experiences with the use of open educational resources (OERs). The students were generally positive about their OERs, especially if they considered themselves to be very comfortable with digital devices or if they had already had an experience with an OER in a previous course. Students over 30 were less positive with regard to OERs than their younger peers.

Most of the students surveyed read their OER most of the time from a pdf file on a computer, although many used a smart phone when the circumstances were appropriate. Many students indicated that they would have preferred to have read their OER from a paper copy rather than a digital device.

Authors and designers of OERs need to be familiar with how students use their OERs in order to make sure that what they create is well-suited to the students' needs. A number of recommendations are provided regarding ways to make OERs suitable for all students.

Introduction

The objective of this project is to discover what students in British Columbia post-secondary institutions liked and disliked about the open textbook(s) they used in a course they were enrolled in, and how those issues affected their learning experience. The results have been used to illuminate what kinds of questions need to be considered when designing open educational resources (OERs) to meet the needs of all students.

There is an extensive literature on OERs in post-secondary education. Much of the existing research has been focused on the benefits of cost savings for students using OERs, and this is a primary motivation of the BC Government's past and current investment in the BCCampus Open Textbook Project (Ministry of Advanced Education, 2019). There is no doubt that open textbooks represent significant savings for students. Typical commercial textbooks cost over C\$100 each (Hilton et al, 2014), while most open texts are virtually free. Various studies have shown that those types of cost savings can provide benefits to students' academic outcomes and their personal well-being (e.g., Ozdemir and Hendricks, 2017).

More important than cost, however, is whether students learn as much in their courses using open texts as they do when using traditional textbooks. Based on a study involving many thousands of students at several US institutions, Fischer et al. (2015) concluded that students enrolled in courses using OERs performed as well or better than those in courses with traditional texts. For example, the OER students were slightly more likely to complete the course and earned slightly better marks than those using traditional texts. In addition, students using OERs enrolled in more courses during the term in question,

and also more in the following term than students using traditional texts. Hilton et al. (2016) have also written about the role that low-cost OERs play in allowing students to keep up their academic momentum by enrolling in more courses each term than they would be able to otherwise.

On the other hand, we also know that every student is different, and while there may be an overall trend of positive outcomes for students using OERs, like every other averaged outcome, this does not apply to all students.

Method

This study involved students enrolled in courses during the fall term of 2018, in which the primary resource was an OER. The choice of courses to include was based on the instructor being willing to ask their students to participate in an on-line survey. The institutions, courses and OERs that took part in the study are listed in Table 1. Nine institutions are represented ranging from some of the smallest colleges to some of the largest universities in British Columbia. Of the thirteen courses listed, 12 were face-to-face courses while one was an on-line course. Most of the courses were at the first-year level. Several different discipline areas are represented, including History, Earth Science, Sociology and Business. Most of the OERs are from the BCCampus collection.

Table 1 Institutions, courses and Open Educational Resources represented in the project

Institution	Course	Open educational resource*
Thompson Rivers U.	Canada before confederation	Canadian History: Pre-Confederation
Kwantlen Polytechnic U.	Cultures in collision	Canadian History: Pre-Confederation
Trinity Western U.	Pre-Confederation History of Canada	Canadian History: Pre-Confederation
U. of the Fraser Valley	Post-Confederation History of Canada	Canadian History: Post-Confederation
U. of British Columbia	Physical Geology	Physical Geology
Selkirk College	Introduction to Physical Geology	Physical Geology
U. of Victoria	Dynamic Earth	Physical Geology
Thompson Rivers U.	Introduction to Earth Science	Physical Geology
North Island College	Introduction to Sociology	Introduction to Sociology (2 nd Can. Ed.)
Douglas College	Social Processes	Introduction to Sociology (2 nd Can. Ed.)
Thompson Rivers U.	Introduction to Sociology	Introduction to Sociology (2 nd Can. Ed.)
Thompson Rivers U.	Financial Operations Control in Tourism	Management Accounting Concepts and Techniques
Thompson Rivers U.	Developing New Tourism Enterprises	Managerial Accounting, Entrepreneurship and Innovation Toolkit

* all are from the BCCampus collection except for Managerial Accounting (Saylor Academy), Management Accounting Concepts and Techniques (SUNY at Albany), and Entrepreneurship and Innovation Toolkit (University of Saskatchewan)

The survey instrument is included as Appendix 1. The survey includes several demographic questions, and a series of multiple-choice and open text questions about the students' experiences with their OER. This instrument and the project methodology were approved first by the Thompson Rivers University Research Ethics Board, and then by the REBs at all eight other institutions represented. A few of those institutions were willing to accept the Thompson Rivers REB approval document, but most required their own REB approval procedure to be followed.

Instructors that agreed to participate in the project were asked to e-mail their students the following invitation letter at around the 80%-complete point in the course:

"A colleague from TRU and BCCampus is doing some research into students' experiences with open text books and he would be grateful if you would complete a short (<10 min.) survey regarding the text used in this course. You are under no obligation to do the survey, and I will not be aware if you have done it or not. The survey can be accessed at: <https://www.surveymonkey.ca/r/FGZQPZ9>".

About 600 seats were available in the twelve courses listed in Table 1 during the fall of 2018, but the actual number of registered students may have been lower as it is likely that not all of the courses were enrolled to their maxima. Of those students, 116 completed the survey, or slightly less than 20% of the nominal 600 seats. This number is disappointingly low. There are several possible reasons for the low response rate, including student apathy, student stress and fatigue near to the end of term, lack of enthusiasm about the project on the part of the instructor, and the REB-required statement that students were under no obligation to complete the survey. No incentive was provided to students to participate in the survey.

Results

Students were asked to identify the course they were in and the OER being used in that course. They were also asked to indicate which of three age ranges they fell within, their level of comfort with computers and other digital devices, and whether or not they had used an OER in a course prior to the one in question.

Of the 116 students that completed the survey, 32% were under 20, 51% were between 20 and 30 and 17% were over 30. Exactly half of the students were using an OER in a course for the first time, 27% for the second time, and 23% for the third time. Almost all of the students described themselves as being either "comfortable" (32%) or "very comfortable" (66%) with computers and other digital devices. Only 1% described themselves as being "not comfortable".

The demographic responses are summarized in Figure 1.

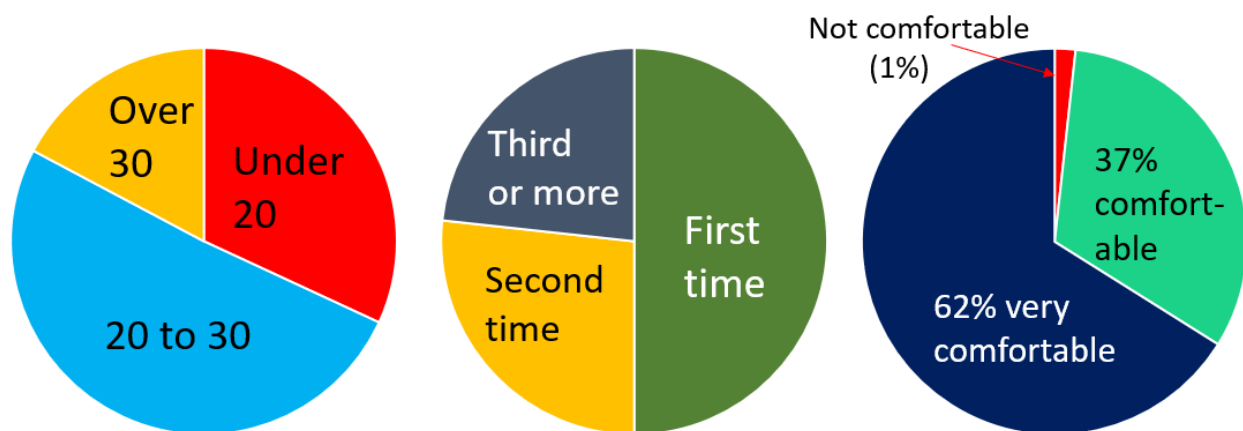


Figure 1 Responses to questions about age (left), experience in courses with OERs (centre) and self-perceived comfort with computers and other digital devices (right)

Responses to the statement: “An on-line textbook is easier to use than a print textbook” are summarized on Figure 2 (top left). Over 47% of students “agree” or “strongly agree” with this statement, while 29% either “disagree” or “strongly disagree” and 24% are neutral.

Responses to the same statement, broken down according to the age of the students, are shown on Figure 2 (top right). It is evident that the younger students are most positive about OERs. 49% of students under 20 agree (or strongly agree) with this statement, while only 25% disagree (or strongly disagree). On the other hand, 45% of students over 30 agree with that statement, while 45% disagree.

Students that have used an OER in a previous course tend to be more positive about the OER in their current course (Figure 2, lower left). 52% of experienced users agree that an on-line text is easier to use than a printed text (and 30% disagree) while 41% of first-time users agree (and 31% disagree).

Of the students that are merely “comfortable” with digital devices, 41% agree and 36% disagree (Figure 2, lower right), while of the students that rate themselves as “very comfortable” 52% agree and only 27% disagree.

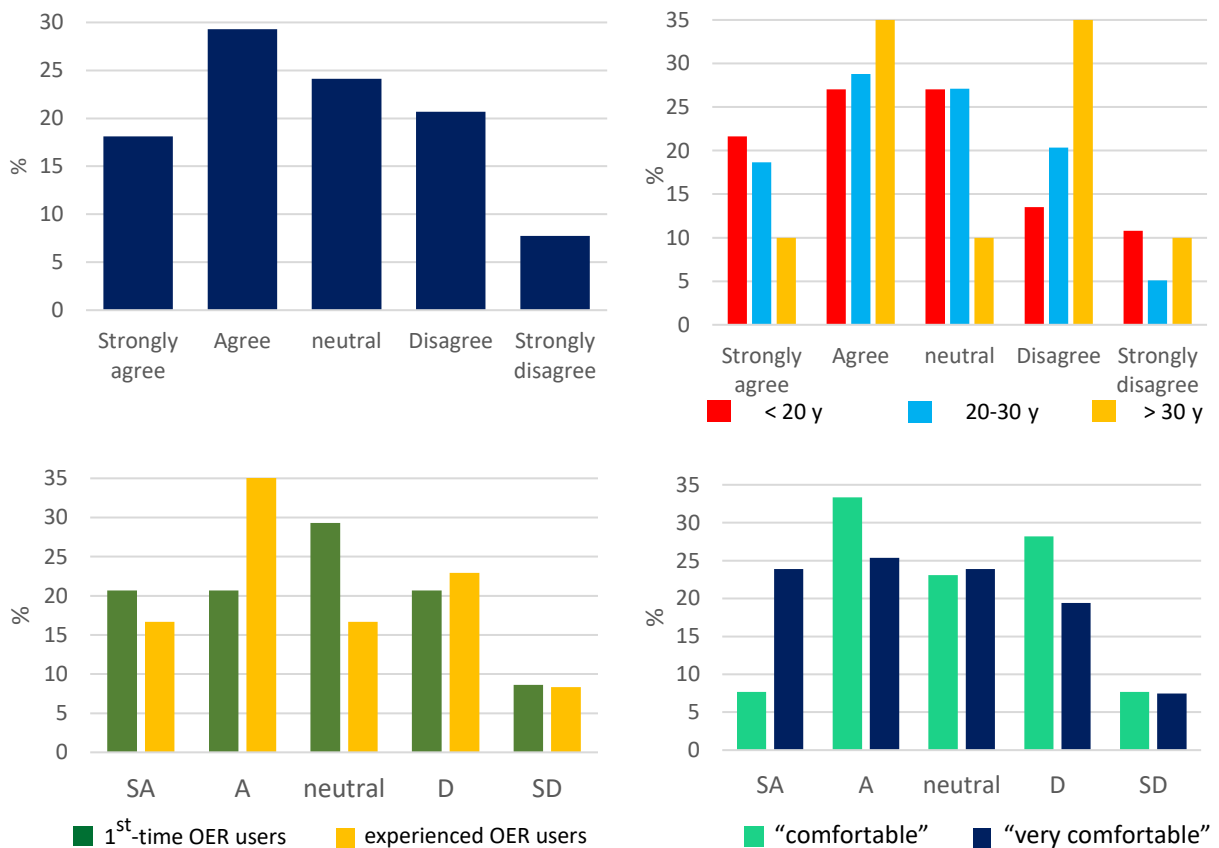


Figure 2 Responses to the statement “An on-line textbook is easier to use than a print textbook”

In summary, it is apparent that:

- younger students are more positive about OERs than older students (in fact older students appear to be ambivalent on average),
- students taking a second or third course with an OER are more positive than those in an OER-course for the first time, and
- students that consider themselves to be “very comfortable” with digital devices are more positive than those that are merely “comfortable”.

Students were asked if they had any comments about the ease of access or convenience of their on-line text. Of 67 comments 64% were generally positive, while 36% were generally negative. 17% of the positive comments related to the text being free of cost, and some of these are as follows:

“Overall [the] text was easy to use and I really appreciated the free/low cost option of it.”

“It's 100% the "free" that pulls me in. I strongly believe that all textbooks should be offered for free.”

“I think it's awesome because it's free! And students can choose to print it or not.”

19% of the comments related to the portability and versatility of the digital OER. For example:

“The online access gave me the ability to study and do my assignments anywhere at any time.”

“It is easy to search for keywords or specific chapters. That would not be possible in a printed textbook.”

“Once I realized that I could access it via cellphone, I was able to make use of short periods of time - on skytrain, waiting in the pickup lane at school...”

15% of the comments related to negative feelings about digital OERs. Some examples are as follows:

“I don't like reading off a computer screen.”

“I really disliked the online texts, although they were pretty easy to access, I much prefer paper texts even if it cost [sic]. I dislike having to bring your computer everywhere and switch screens every time you want to look at the text.”

“Found that I use the textbook less when it's online.”

OERs are typically available to students in a variety of file formats (pdf, html, mobi, etc.). When asked in what format they most frequently used their text, 58% responded that a “pdf” was their first choice while 40% chose “html” (Figure 3, left). It can be assumed that these students were accessing the html files directly from the text website, while students reading from pdf files had downloaded the pdf to their own device. Only 2% used other formats “most frequently”. When asked which format they second-most frequently used their text, “pdf” and “html” were still the top choices for most students, but 22% of students identified other formats that are suitable for portable devices (Figure 3 right). When

broken down by age, the older students still strongly preferred pdf and most avoided the use of “other” formats (Figure 3 right).

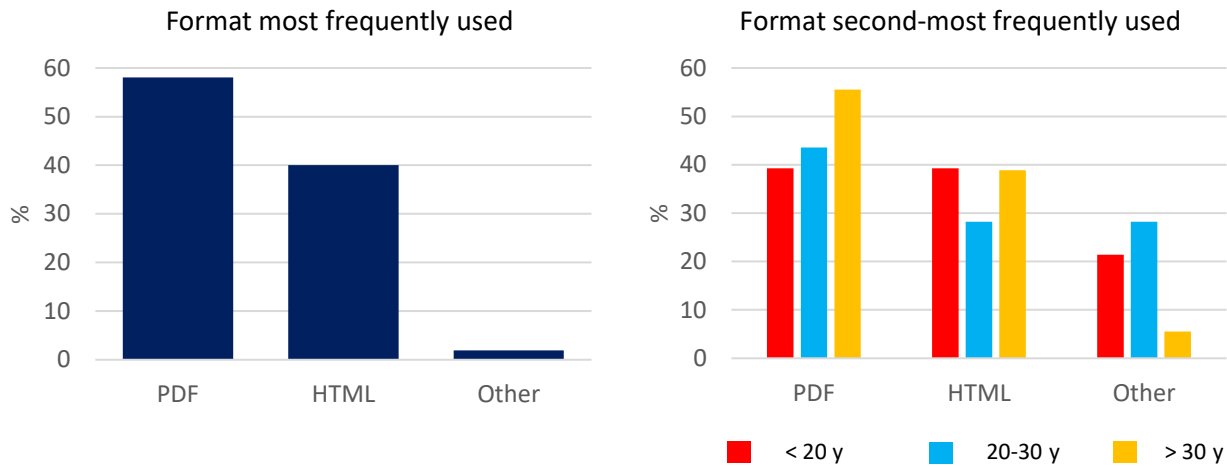


Figure 3 Responses to the questions: “In what format did you most frequently use the text book?” and “In what format did you second-most frequently use the text book?”

Students were asked what type of device (as distinct from what file format) they used to read their text. Most students (77%) most frequently read their text on a computer, either directly from the text website or from a downloaded pdf file on a computer (Figure 4 left). Only 12% most frequently used a phone or tablet, while 11% used a paper copy. The second choice for a majority of students is a smart phone, although a significant number (18%) read from a paper copy and the rest still used a computer (Figure 4, right). Students older than 30 tend to have a much greater preference for a paper copy (33%) than those under 30 (18%), and especially those under 20 (11%).

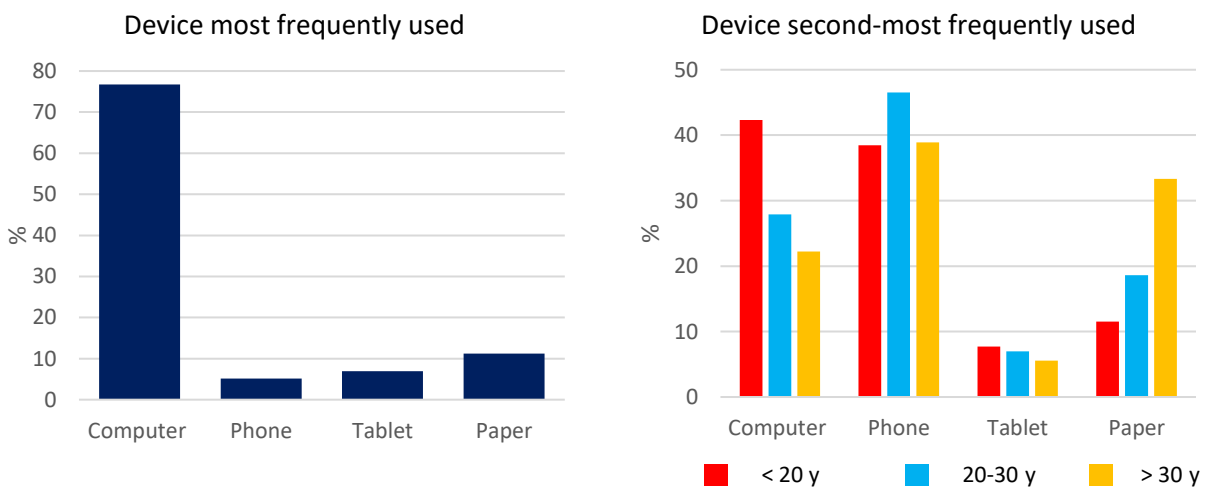


Figure 4 Responses to the questions: “From what type of device did you most frequently read the text book?” and “From what type of device did you second-most frequently read the text book?”

As shown on Figure 5, only 27% of students printed some or all of their text, but there is significant variation in responses to this question by the age of the students. Only 14% of the under-20s and 20% of the 20-30s printed some or all of it, while 66% of over-30 students printed some or all of it. Students

were asked where that printing was done. 63% did the printing at home, 20% at a commercial printer, 10% at their institution, and 7% via the textbook website.

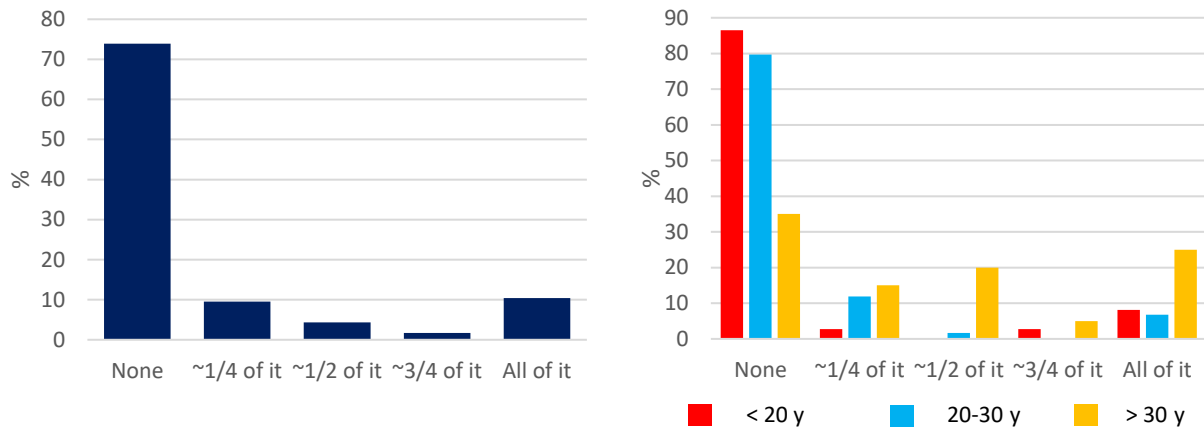


Figure 5 Responses to the question “Did you make or purchase a printed copy of any part of the text?”

Students that didn’t make or purchase a printed copy of their text indicated various reasons for not doing so. Just over 30% said they prefer to use a digital copy, 36% said they didn’t want to waste paper, and 26% said the cost was too high (Figure 6). On the other hand, a surprising 89% of the students answered a question about whether they might have acquired a printed copy under different circumstances. 40% identified cost as a barrier, 35% indicated that convenience was a factor, while 18% would have liked the option to choose specific chapters to print (Figure 6).

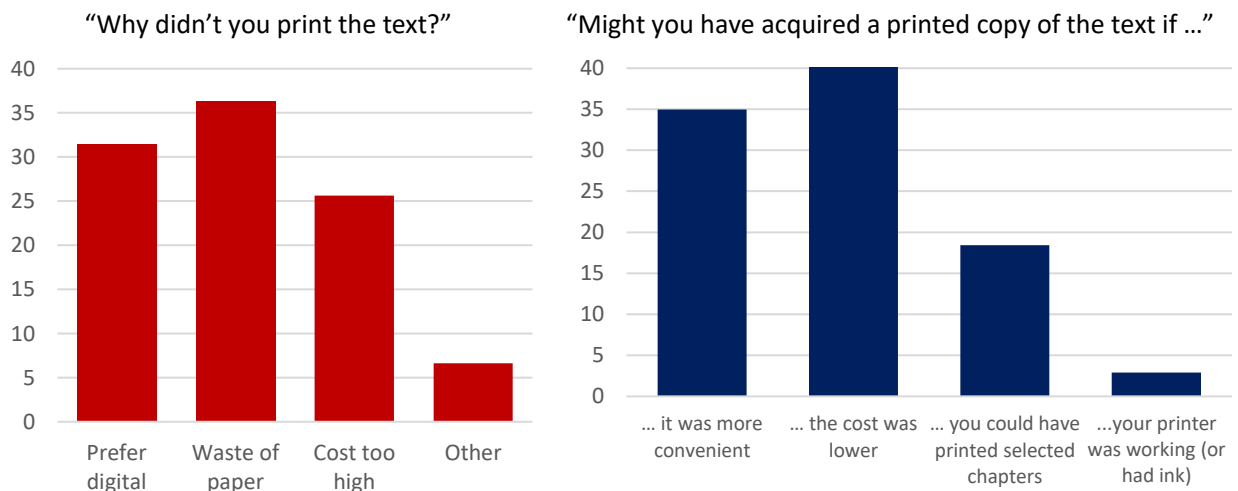


Figure 6 Responses to the questions “Why didn’t you print the text?” and “Might you have acquired a printed copy of the text if ...?”

Most students read their OER text on a computer from a pdf file. This is consistent with the findings of Lindshield & Adhikari (2013) and with Jhangiani & Jhangiani (2017), and reflects that students like to have a copy of the text on their computer for use when they cannot access the internet, and that they have confidence in the portability and universality of pdf files. Many also like the freedom to read their text anywhere they happen to be, using a mobile device.

On the other hand, many students—especially mature students—prefer to read from a paper copy, and there is some evidence to suggest that more of the students surveyed would have chosen that option if it had been more convenient or less expensive. This observation is consistent with numerous studies on the acceptance of digital versus printed copies of commercial texts. Authors such as Millar and Schrier (2015) and Woody et al. (2010) have reported that sales of digital licenses of commercial texts are low because most students prefer print over digital copies, even when there is a significant price advantage to the digital version. In another study Shepherd et al. (2008) stated: “...students using the electronic text reported spending less time reading for class compared to students using the paper text and generally evaluated the electronic text unfavorably. No student who purchased an electronic text in a prior class chose to purchase it for introductory psychology. These findings suggest that it may be premature to abandon the paper text in favor of the electronic text.”

Discussion and recommendations

It is evident from the results summarized above that while most of the BC post-secondary students surveyed appreciate the significant cost savings and the digital convenience of open textbooks, many have mixed feelings about using them. Furthermore, many students may not be using their OERs in the way that we intended or expected them to, and therefore may be losing some important functionality inherent in digital OERs. Some of the significant findings are:

- 1) Most of the students surveyed read their OER from a pdf file and while doing so they may not always have had access to the internet.
- 2) Most students accessed their OER most of the time on a computer.
- 3) If they were not using a computer, many students accessed their OER on a smart phone.
- 4) Many students would have preferred to have read their OER from a paper copy rather than a digital device.

If students typically read an OER from a pdf file on their computer—in some cases without access to the internet—they are likely to be missing many of the important benefits of a digital textbook. These might include access to a glossary or an index or to higher-resolution versions of images or tables, links to external resources, interactive learning aids, quizzes and answers to questions or exercises. It is the responsibility of textbook authors and designers, therefore, to ensure that the students do not lose access to these important learning aids simply because they choose to read offline from a pdf. For example, images or tables that have important detailed information should be designed to be clearly visible in a stand-alone pdf. Furthermore, it is important that course instructors are aware—and make students aware—of the types of on-line accessible features in their text, and what they might be missing if they only read from a pdf.

If most students access their text most of the time using a computer, they will be able to access higher-resolution images and tables than would be the case if they are using a phone or tablet. But a computer is not as easily manipulated as a phone or a tablet—or a book for that matter—so care must be taken to ensure that everything is readable without having to be rotated. Tables and figures that are sideways are difficult to read, and students are just as likely to ignore them as to go to the effort of turning a computer on its side or craning their necks to read them.

The opportunity to read an OER on a phone or tablet provides accessibility that is a game-changer for many students, but phone screens are small, so it is critical to make sure that the layout is designed to work well for the small screens of phones. This applies especially to figures and tables.

The preference of many students to read from paper instead of a digital device is something that we cannot afford to ignore, and this preference is not only about convenience or habit. One of the comments in this study was: “Found that I use the textbook less when it’s online”, and as Shepherd et al. (2008) noted: “...students using the electronic text reported spending less time reading for class compared to students using the paper text”. If some students are reading their textbook less because it is digital, then we have a problem, and we need to take steps to ensure that they have ready access to an affordable paper copy. Some of those steps should include:

- making inexpensive printed copies available on the campus where the course is offered,
- providing separate pdf files for each chapter of a book, so that students can easily print only the parts they need or want, or only the chapters that are being used in their course, and
- offering a mail-out service of printed texts to students in remote areas, and ensuring that the cost of mailing never exceeds 50% of the cost of the book.

Acknowledgements

I am grateful to Rebecca Cooling and Tannis Morgan of BCcampus for their support and encouragement during my tenure as a BCcampus Open Education Research Fellow, and also to my Open Education Research Fellow colleagues: Florence Daddey, Johnathan Verrett, and Erin Fields. I thank the faculty members that participated in the project: Ron McGivern, Marni Westerman, Lian Dumouchel, Robin Read, Robert Burkinshaw, Lucinda Leonard, Brett Gilley, Kim Green, John Belshaw, Bob Fuhr, and Jen Wrye, and their students and my students.

References

- Fischer, L., Hilton, J., Robinson, T.J., & Wiley, D.A. (2015). A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students. *Journal of Computing in Higher Education*, 27(3), 159-172.
- Hilton III, J. L., Robinson, T. J., Wiley, D. A., & Ackerman, J. D. (2014). Cost-savings achieved in two semesters through the adoption of open educational resources. *The International Review of Research in Open and Distributed Learning*, 15(2), 1–18.
- Hilton III, J. L., Fischer, L., Wiley, D., & William, L. (2016). Maintaining Momentum Toward Graduation: OER and the Course Throughput Rate. *The International Review of Research in Open and Distributed Learning*, 17(6). <https://doi.org/10.19173/irrodl.v17i6.2686>
- Jhangiani, R. S., & Jhangiani, S. (2017). Investigating the perceptions, use, and impact of open textbooks: A survey of post-secondary students in British Columbia. *The International Review of Research in Open and Distributed Learning*, 18(4). <http://dx.doi.org/10.19173/irrodl.v18i4.3012>
- Jhangiani, R. S., Dastur, F. N., Le Grand, R., & Penner, K. (2018). As Good or Better than Commercial Textbooks: Students' Perceptions and Outcomes from Using Open Digital and Open Print Textbooks. *The Canadian Journal for the Scholarship of Teaching and Learning*, 9 (1) <https://doi.org/10.5206/cjsotl-rcacea.2018.1.5>
- Lindshield, B., & Adhikari, K. (2013). Online and campus college students like using an open educational resource instead of a traditional textbook. *Journal of Online Learning & Teaching*, 9(1), 1-7. Retrieved from http://jolt.merlot.org/vol9no1/lindshield_0313.htm
- Millar, M., & Schrier, T. (2015). Digital or printed textbooks: Which do students prefer and why? *Journal of Teaching in Travel & Tourism*, 15(2), 166-185.
- Ministry of Advanced Education, (2019), More open textbooks arriving on student bookshelves, accessed at <https://news.gov.bc.ca/releases/2019AEST0028-000683>, April 2019.
- 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.
- Shepperd, J. A., Grace, J. L., & Koch, E. J. (2008). Evaluating the electronic textbook: Is it time to dispense with the paper text? *Teaching of Psychology*, 35(1), 2-5.
- Woody, W. D., Daniel, D. B., & Baker, C. A. (2010). E-books or textbooks: Students prefer textbooks. *Computers & Education*, 55, 945-948.

Appendix 1 The survey instrument used in this study

Open textbook use survey

The goals of this survey are to provide us with an increased understanding of the ways in which students use open textbooks in post-secondary courses, to find out what works well for students and what doesn't, and to look for ways to enhance open textbooks so that they meet the needs of all students.

By completing the survey you acknowledge that you understand the goals of the study, and that you agree to participate. You are under no obligation to complete the survey and your instructor will not know whether or not you have participated. You can withdraw at any time by not responding to the last question, although once you have responded affirmatively to the last question you cannot withdraw.

Your responses will be stored on a computer in Canada, and are password protected. Once the data analysis is complete the responses will all be deleted. Your name will not be associated with your responses, and the IP information collected by the survey instrument cannot be used to identify you.

The principal investigator on this project is Dr. Steven Earle of Thompson Rivers University (email: searle@tru.ca, tel. 250-247-8299). It is possible that the results of this study will be presented at a conference and/or in a written publication. If you have any questions or comments about the ethics of this survey please contact the Research Ethics Board at Thompson Rivers University (tru-reb@tru.ca).

It should take about 10 minutes to complete the survey.

1. I understand the goals of the study and agree to participate.

Yes

No

2. What is your age range?

- Under 20
- 20 to 30
- 30 to 50
- over 50

3. How would you rate your comfort with the use of computers and other electronic devices?

- Very comfortable
- Comfortable
- Not at all comfortable

4. Please identify the course that you are referring to in answering these questions.

Please select one answer

- HIST-1113 (KPU)
- HIST-136 (TWU)
- HIST-102 (UFV)
- GEOL-111 (VIU)
- EOSC-110 (UBC)
- GEOL-1110 (Langara)
- EOS-120 (U. Victoria)
- SOC-110 (NIC)
- SOCI-1125 (Douglas)
- SOCI-1110 (TRU)

5. Please identify the on-line textbook that you are referring to in answering these questions.

Please select one answer

- Canadian History Pre-confederation (Belshaw)
- Canadian History Post-confederation (Belshaw)
- Physical Geology (Earle)
- Introduction to Sociology (Little)

6. Approximately how far have you progressed through the course?

Please select one answer

- Approximately 1/4
- Approximately 1/2
- Approximately 3/4
- Completed or nearly completed

7. Before taking this course, how many times have you used an open on-line text in a post-secondary course?

Please select one answer

- Never (this is my first experience with an open text)
- I've used an open text once before
- I've used an open text at least twice before

8. Please rate the following statement: An on-line textbook is easier to use than a print textbook.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

9. In what format do or did you most frequently use the text book identified above (Q. 5)?

- HTML (accessed directly from the text website)
- PDF
- MOBI
- XHTML
- WXR
- ODT
- Don't know

10. In what format do or did you second-most frequently use the text book?

- HTML
- PDF
- MOBI
- XHTML
- WXR
- ODT
- Don't know
- Not applicable

11. What type of device do or did you use most often to read the text?

- Paper copy
- Computer
- Tablet
- Smart phone

12. What type of device did you use second most often to read the text?

- Paper copy
- Computer
- Tablet
- Smart phone
- Not applicable

13. Did you make or purchase a printed copy of any part of the text?

- No, none of it
- Yes, about 1/4 of it
- Yes, about 1/2 of it
- Yes, about 3/4 of it
- Yes, all of it

14. How did you print the text?

- At home
- Through a commercial printing service
- Through a service provided on the text website
- Through a service provided by my institution

15. Did you print in colour?

- Yes in colour
- No, only in black.

16. When using your paper copy of the text did you ever refer to the digital version (for example to look at figures in colour or at higher resolution)?

- never
- infrequently
- frequently

17. Why did you decide not to print any of the text?

(select any that apply)

- I preferred using the digital version
- My printer wasn't working or was out of ink
- I didn't want to waste paper
- The cost of printing was too high
- Other (please specify)

18. Might you have acquired a printed copy of the text if (select any that apply):

- it was more convenient
- the cost was lower
- you could have selected certain chapters to print
- your printer was working (or had ink)

Please feel free to provide comments on any of the following issues. Please make sure that your comments are in reference to how easy the text is to use. This survey is not about the contents of the text, or the presentation or the writing style etc., nor is about the course that the textbook is used in.

If you don't have any comments please scroll down to the last question, which must be answered if your responses are to be included.

19. Do you have any comments on the ease of access or convenience of your on-line text?

20. Please comment on any difficulties that you had in accessing the text.

21. Do you have any comments on the ease with which you could read the text when using a digital version?

22. Are there any changes that you might suggest regarding the accessibility of the text?

23. Select "yes" below to submit your survey. Your responses will not be used if you do not complete this step.

- Yes, please use my responses.
- No, I do not wish my responses to be included.

Thank you for your time!