



COMMONWEALTH *of* LEARNING



**Learners' Access
to Educational
Materials in Select
Institutions within
the Commonwealth**

Learners' Access to Educational Materials in Select Institutions within the Commonwealth

Michael Paskevicius



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ABSTRACT

The purpose of this report is to assess students' access to educational materials in select institutions within Commonwealth countries. The report starts with a review of the existing literature on problems and barriers to students' access to educational materials, including textbooks. The review is used to develop a research study and appropriate questionnaire tools to undertake a survey of students in select institutions. Quantitative and qualitative approaches are then used to analyse the data. The findings indicate that learners are now engaging with a complex ecosystem of learning materials, both print and digital, in a multitude of differing forms and formats, with various terms of use and durations of sustained access. Furthermore, the results show that learners are not acutely aware of open educational resources (OER) and in some cases conflate OER with online knowledge resources, indicating that much more work needs to be done to educate learners about OER, where to find them, and how they can be used.

Keywords: open educational resources, learning materials, access to education

CONTENTS

Abstract	iii
Introduction	1
Literature Review	3
Types of educational materials	3
How materials get selected for use in higher education	8
Conceptualising access	9
Methodology	13
Results	14
Demographics and student characteristics	14
Device ownership, access and use	14
Types of learning resources assigned	16
Patterns of access to proprietary resources	17
Spending on learning materials	19
Preferences for different types of learning materials and ways of interacting with them	21
Awareness and use of OER	23
Discussion	25
How do learners' reported access to and use of information and communication technologies impact their access to educational materials?.....	25
How do perceptions around the cost and availability of textbooks impact access to educational materials?.....	26
Are learners being assigned and/or are they interacting with OER, and what level of awareness do learners have around OER?	27
Conclusion	28
References	29
Appendix	33

List of Figures

Figure 1.	Forms of educational materials	7
Figure 2.	Granularity of educational resources	9
Figure 3.	Device ownership among participants	15
Figure 4.	Most frequently used device to access the Internet for studying	15
Figure 5.	Average number of resources assigned, by type	16
Figure 6.	Participants who chose not to purchase textbooks due to cost, with rationale	18
Figure 7.	Access choices and average number of resources accessed	18
Figure 8.	Box and whisker plot displaying reported spending on learning materials (USD)	20
Figure 9.	Resource costs as part of the course selection process	20
Figure 10.	Types of learning resources most commonly sought	21
Figure 11.	Success in finding relevant learning resources online	21
Figure 12.	Preferences for interacting with learning materials	22
Figure 13.	Types of materials most often downloaded by number of responses and percentage of those that answered in each category	23

List of Tables

Table 1.	Types of educational materials and implications for access	11
Table 2.	Participant year and modality of study	14
Table 3.	Internet access location by country	16
Table 4.	Digital versus print materials by primary device used for study	17
Table 5.	Average reported spending on learning materials	19
Table 6.	OER referenced by respondents	24

INTRODUCTION

As identified in the United Nations Universal Declaration of Human Rights, the Millennium Development Goals and, more recently, the Sustainable Development Goals, the ability for individuals to universally access quality education is an essential human right. It has been argued that access to educational materials provides one of the most consistent correlations with academic achievement, a view that has justified historical investments in educational materials around the world (Heyneman, 2003). Since the time when educational materials were limited to printed formats, significant advances have been made in digital formats. Educational materials in all formats can serve as critical components in the design of learning and provide resources to support and enhance pedagogy. Consequently, ensuring access to quality learning materials is necessary to help achieve the goals set by the United Nations. While great strides have been made in working towards increasing access to educational experiences, access to high-quality, contextually relevant and easily accessible educational materials still remains an issue in Commonwealth schools. This is further complicated, while also potentially enhanced, by the ongoing digitisation of educational resources, evolving access and copyright models, and ways in which educational resources can be integrated into and form part of a learner's personal library of knowledge resources.

Understanding the current situation of access to educational materials remains a challenging problem. The circumstances with regard to accessing learning materials differ within and between classrooms, districts, cities, regions and countries around the world, and they may even vary from lesson to lesson in any given context. Information about the actual number and distribution of resources is problematic to collect on a regular basis. Scholars have suggested that a country's commitment to supporting access may be gleaned through its annual expenditure on education, of which educational materials often represent 1–10% of the total (Chon, 2007).

In the context of higher education, educators most often select the materials they deem to be most relevant to support a learning experience, and the responsibility for gaining access to those materials has largely been placed on the learner. As a result, the prices of resources such as textbooks have risen dramatically over the years — in the United States, the price of textbooks has

risen at three times the rate of nationwide inflation (*Economist*, 2014). Some have argued that this is because the educators who select and recommend these textbooks aren't the ones required to pay the high price for access (Richardson, 2015). In developing countries the situation is compounded, as educators and learners remain heavily dependent on imported textbooks and reference books, and in many cases these resources are costly (Barton et al., 2002).

This research explores to what extent access is shaped by the current landscape of educational materials, which includes traditional textbooks, online resources and open educational resources (OER) in both print and digital forms. The study investigates the ease of access reported by learners specifically in Commonwealth countries, and their perceptions around access to educational materials.

LITERATURE REVIEW

An assessment of the literature concerning access to educational materials begins with a review of the various types and forms of educational materials commonly used in higher education. This is followed by a section exploring how educational materials get selected, primarily by faculty, for use in coursework. Finally, a section on conceptualising access seeks to interrogate the factors that impact access, based on the various types and formats in which educational materials currently exist.

Types of educational materials

There is a growing global demand for access to education and as a result, a greater need for access to educational materials. Learning activities, lesson plans, textbooks, presentations, simulations and other educational materials are typically used in learning activities to help mediate learners' understanding of concepts and provide resources for teaching and learning. Traditionally, educational publishers have provided these resources, usually at a cost, to schools and learners. More recently, publishers are providing a growing selection of resources in digital form, as either supplements to or replacements for printed materials. Additionally, digital learning materials are becoming available from educators and organisations as freely available OER.

Textbooks are among the most commonly used educational resources within formal higher education. In some cases, the textbook forms the central resource guiding activities and discussion in the course; in others, the textbook may play a more peripheral role, accompanying other discussions and resources selected by the facilitator. In both cases, access to the textbook and learning resources plays an essential role in supporting learning. As textbooks are selected and prescribed by educators, students often have little choice over which textbooks they purchase; however, they have traditionally had some choice in where and how they obtain their textbooks (Ashby, 2005). A survey conducted by the National Association of College Stores (NACS, 2018) found that 52% of educators report that quality and fitness remain the most important decision criteria for selecting resources, while the cost of the resource remains a less important decision factor, reported by just 14%. Remarkably, 36% of educators

reported not knowing the retail cost of the textbooks they were assigning. The NACS also found that learners exercised choice in how they purchased their books, with 63% reporting having purchased new texts from either the campus bookstore or online retailers who may offer the textbook at a lower price. Additionally, 56% of learners reported buying their books used, while 25% obtained digital copies. A similar survey conducted by the Florida Virtual Campus (2016) provides further insight into students' preferences for procuring their textbooks. The survey report that 64% of learners chose to purchase books from a source other than their campus bookstore to save money, 49% opted to buy used textbooks, 47% rented printed textbooks and 30% rented digital textbooks, 24% shared textbooks with peers, and 39% then sold their used textbooks to recover some of the initial costs. Moreover, the survey results suggest that the cost of textbooks is having a detrimental impact on student success. Of those surveyed, 67% had made the decision to not purchase a required textbook, and 38% reported having earned a poor grade while 20% reported having failed a course as a result of not having the textbook. Students also reported other strategies for managing the high cost of learning materials, including choosing to take fewer courses (48%) or dropping a course (26%) because they could not afford the required materials (Florida Virtual Campus, 2016).

While educational publishers continue to produce textbooks, they have further expanded their offerings by developing digital version of textbooks, ancillary or supplementary materials, applications, games and learning environments that may be used to complement traditional materials. These materials may be included with the textbook on a compact disc or offered online either at a cost, through user registration, or as openly available resources for users. Often, access to these resources requires that a learner has access to a computer or mobile device or the ability to print online resources for use as needed. Worth noting is that many of these online resources are not suitable for print (for example, online interactive software, games, videos, etc.). Some of these online resources also include technical restrictions known as digital rights management (DRM). These restrictions, commonly known as digital locks, technologically limit the user from freely accessing, printing, copying, marking up and highlighting the resource and often require that it be accessed exclusively while the user is connected to the Internet (McGreal, 2017).

Academic publishers have also started changing their business models, with the introduction of inclusive access subscriptions. These involve educational institutions partnering with publishers to make online educational materials available to learners, rather than having each student individually purchase their learning materials. The cost of these learning materials is often bundled with the course fees and applied when learners enroll for a course (McKenzie, 2017). Publishers claim they can offer these resources at significant discounts by offering them to many learners (Pearson, 2017; VitalSource, n.d.). The use of

these subscriptions appears to be gaining popularity, with Seaman and Seaman (2019) reporting that 37% of educators require their learners to use an online homework system and 7% require the use of an inclusive access subscription. These types of resources are increasingly being adopted by educators yet still come at a cost to learners, who then have fewer options around retaining access or selling their copy to recover some of the initial cost. Essentially, learners pay a fee to access their learning materials for the duration of a course when using the inclusive access model, rather than owning the material, with the ability to sell it to recover cost or retain it for future reference (McKenzie, 2017). Hendricks (2019) noted that these types of services are increasingly being prescribed as a required part of a learning experience, and as a result, learners are essentially mandated to use the service as offered by the vendor. While prescribing traditional textbooks creates some choice for learners in that they can purchase an old copy, use a library copy or buy a digital version, digital materials may only be made available through the publisher's website and require that each learner register an account for assessment purposes.

An alternative to sourcing materials from publishers is to use educational resources that are freely available online. Increasingly educators and organisations are sharing their created learning materials online. Modern information and communication technologies have enabled educators and individuals to create, adapt, curate and share learning resources, blurring the lines between traditional publishers and consumers (Brown & Adler, 2008). The Internet now provides a global network that facilitates searching for and accessing online resources, a growing subset of which have been created and shared using open copyright licences that allow their reuse and adaptation by others. That distinction between “online” and “open” resources is important. In the latter, resources are shared in such a way that they can be both accessed and reused by others, while in the former, the use of resources by default and without an explicit statement otherwise has more ambiguous implications. Open licensing models support the legal copying, adaptation and re-sharing of educational materials but are not applied uniformly across the Internet.

Many of these digital educational materials have evolved from what were originally called “information or learning objects” to become known as “open educational resources.” Information objects were originally defined as “the smallest useful piece of information that can be used and re-used, such as an illustration, a question, a definition, a procedure, or a sound” (Hodgins, 2000, p. 46). Information objects could represent some idea or knowledge in a readily shareable, reusable, small chunk of content. Hodgins' vision was that these “knowledge building blocks” could be reused and combined to create a vast array of learning experiences tailored exactly to the learning context. The concept of “information objects” evolved into “learning objects,” and the term was popularised in 2002 by David Wiley, who defined a learning object as “any digital resource that can be reused to support learning” (Wiley, 2000, p. 7).

As learning objects are most often digital resources, they can be copied and distributed to many for use simultaneously, unlike physical copies of educational materials.

The emergence of OER was largely a result of advances in technology and a commitment on the part of various institutions around the world to support education for all. OER were compiled with and from learning objects to form curricular materials. In 2002, the term “open educational resources” was proposed at the UNESCO Forum on the Impact of Open Courseware for Higher Education in Developing Countries (UNESCO, 2002). A legal framework called Creative Commons gave creators of learning objects a licence that they could apply to their works, thereby allowing others to recognise and legally reuse these materials. Repositories of OER are now available from organisations around the world for various subject areas and curricula. In addition to institutional repositories, content-specific repositories have emerged for specialised media, such as images, lesson plans, learning activities, textbooks, videos, and audio. These open repositories of OER offer learners and educators a place to source learning resources. Educators are increasingly recognising OER as a potential source for educational materials. In a recent survey, 31% of educators reporting a general awareness of what OER are and how they might be used, and 15% reported an awareness of what they are, without an explicit understanding of how to use them in teaching and learning (Seaman & Seaman, 2019). Overall, levels of awareness about OER and how they might be used are increasing.

Open textbooks, a type of OER, have emerged to challenge traditional textbooks as a standard learning resource. Open textbooks have gained significant interest around the world, largely because they are a familiar type of resource for educators to consider and can be mapped to existing practices and approaches (Pitt et al., 2019). Various studies have interrogated the use of open textbooks, finding that perceptions of their quality are gradually improving (Bliss, Hilton III, Wiley & Thanos, 2013; Jhangiani & Dastur, 2018; Ozdemir & Hendricks, 2017). Scholars have also found that their use does not negatively impact learning outcomes (Colvard, Watson & Park, 2018; Feldstein et al., 2012; Fischer, Hilton, Robinson & Wiley, 2015; Robinson, Fischer, Wiley & Hilton, 2014). Further, educators attest to the value in having the freedom to adapt and revise these resources as needed (Jhangiani & Dastur, 2018; Petrides et al., 2011; Pitt, 2015; Rolfe, 2017). In the United States, there is a growing consensus that the high cost of educational materials such as traditional textbooks is having a detrimental impact on learning (Seaman & Seaman, 2019). In a recent study, Seaman and Seaman found a growing recognition that OER represent a viable alternative to using a commercial textbook as the default. Furthermore, educators report that these resources, often found in digital formats and with legally explicit and permissive reuse allowances, are much more aligned to the “revise” and “remix” practices that educators are

already engaging in, and they align well with academic knowledge-building practices (Seaman & Seaman, 2019).

Educators have a variety of choices to make when considering the learning materials to be used in their courses. While fitness for purpose still dominates as the most important selection criterion, ease and persistence of access are becoming important considerations. Figure 1 provides an overview of the variety of forms of educational materials discussed above, and some of the specific considerations for each; the information is adapted from Czerniewicz’s (2018) report on the unbundling of higher education, which includes learning resources as part of the discussion.

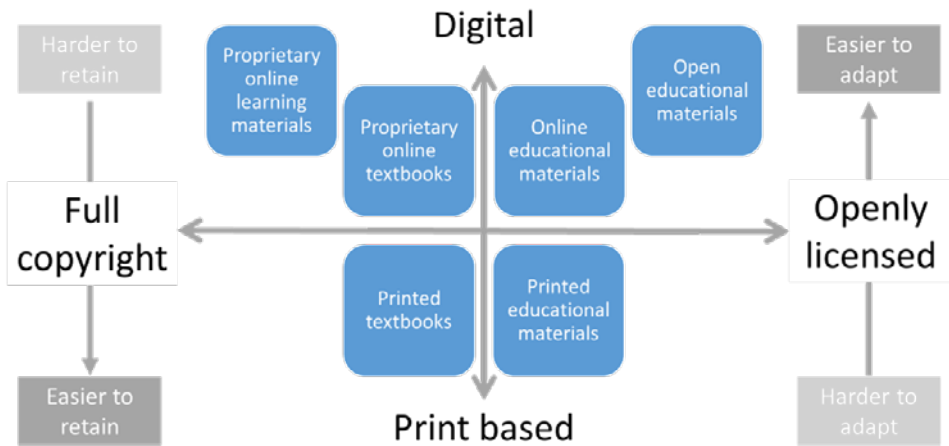


Figure 1. Forms of educational materials (adapted from Czerniewicz, 2018, licensed under a Creative Commons Attribution 4.0 International Licence)

It is important to consider how selecting an openly licensed or copyrighted resource impacts our learners. This can be considered in terms of both format (print versus digital) and copyright (full versus open copyright). As well, the difference between a copyrighted and an openly licensed print resource is different than for a digital resource. Printed materials that fall under traditional copyright categories are easier to retain than many copyrighted digital materials, which now include leasing terms, DRM and other restrictions. On the other hand, openly licensed materials, both printed and digital, are often easier for our learners to retain. Furthermore, when considering openly licensed materials, those offered in digital formats are also easier to adapt. This means that learners can annotate, highlight and mark up resources to support their learning, and educators can customise and adapt them to meet the goals of their course.

How materials get selected for use in higher education

Educational materials are most often selected based on their perceived quality and fitness for purpose to meet the needs of a teaching and learning situation (Calverley & Shephard, 2003; NACS, 2018). The context of a learning resource is important, as this can impact its effectiveness and relevance to teaching and learning needs. Materials suitable within one learning context may be unusable in another ostensibly similar context. Previous studies have addressed issues such as how important educators consider the contextual elements embedded within a resource, how this may factor into their decision to use the materials (Harley et al., 2006), and how educators decide whether the educational materials appropriately fit the context of the learning environment (Bennett, Lockyer & Agostinho, 2004). Naturally, this becomes more complicated when using a variety of learning materials from different sources to support a course, as context may vary among the resources, requiring the educator to conduct work to align and merge the resources into a coherent set. In Hatakka's (2009) study, which investigated the use of OER in developing countries, the contextual elements embedded within materials emerged as one of the greatest barriers to a resource being selected. Both traditional educational materials and OER inherently reflect the cultural and contextual norms of the place in which they were created and of the individual(s) who authored them (Albright, 2005). Additionally, teaching practices differ around the world, and resources that are culturally embedded in a specific context may be more challenging to use effectively in vastly different contexts (Conole, McAndrew & Dimitriadis, 2011). For the learner, the inappropriate use of content, language, graphics or units within an educational resource may also present a challenge when the material is used in a different context. Learners may feel excluded, alienated or misrepresented by the resource. This creates an issue whereby the resource is not effective in supporting learning, creating an accessibility issue.

Materials may also be selected based on their size and scale and their ability to be combined with other resources for integration into learning sequences. Granularity refers to the size or scope of a learning resource (Duncan, 2003). Granularity is hierarchical in most cases. For example, a textbook can be used as a single resource, but even a single chapter in that book, a section of a chapter, or an individual image within the chapter could be a useful learning resource. The most reusable materials will be those that can be easily extracted at any level for reuse. Figure 2 shows a potential hierarchy of educational materials in relation to a learning experience.

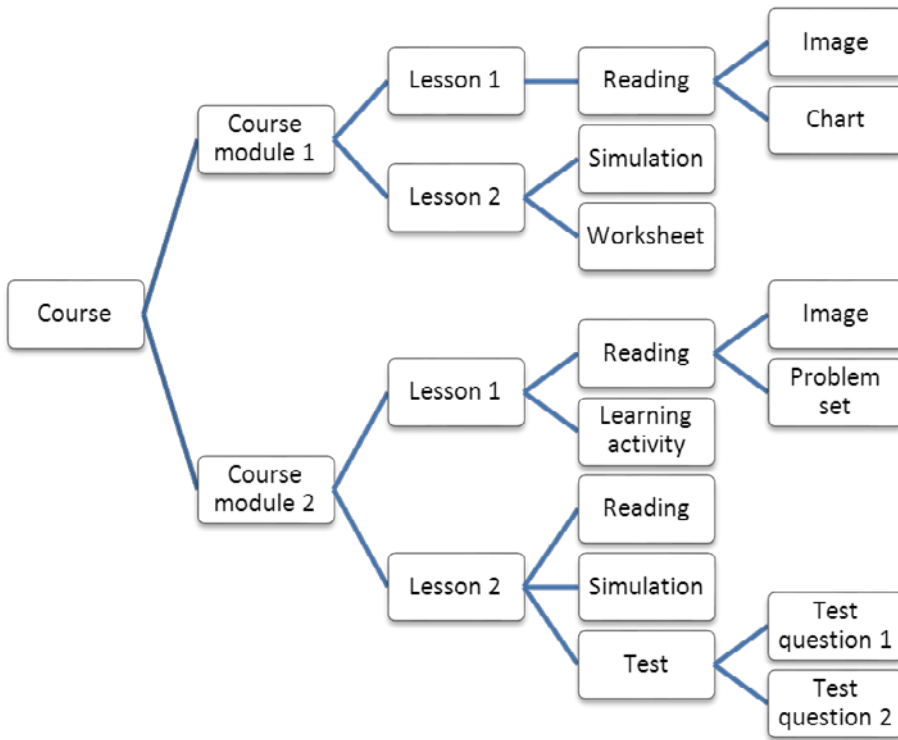


Figure 2. Granularity of educational resources

As Figure 2 illustrates, educational materials may be widely diverse and range in scope from entire courses to individual learning materials. Resources that are most easily reused should be easily extractable at any level for educators to integrate into their own curricula.

Conceptualising access

When assessing access to educational materials, there are several emergent factors and approaches to consider, especially when it comes to materials in digital formats. Access does not simply describe whether or not a learner has a resource in their hands; in the case of digital formats, learners may also need a device and Internet availability to access their materials. Learners now work within a complex landscape as they access a variety of educational materials, from printed matter, to digital resources supplied by publishers, those presented in virtual learning environments, and OER accessed via the Internet. Widespread access to learning materials cannot be assumed, as learners are being asked to negotiate complex and varied types of materials using a variety of means, and as such are having to adjust their personal access practices

(Czerniewicz, 2016). For example, this may involve printing or downloading digital materials for offline use, or using the services of an Internet-enabled café.

Scholars have articulated the notion of digital divides among learners, which have important implications for their ability to access and make meaningful use of learning materials and to develop their personal access practices. While fears of a “digital divide” between those with and without access emerged when the Internet first became popular (Hoffman & Novak, 1998), scholars now warn of a “participation divide” due to variances in Internet usage, advanced skills, and knowledge management practices (Hargittai & Jennrich, 2016); such a divide may result from deficits in the effective and efficient use of the Internet for accessing and using knowledge (Correa, 2010; Hargittai & Walejko, 2008). A third-level digital divide has been described, between those who use the Internet to reap tangible benefits and those who use this access to enhance their lives (van Deursen & Helsper, 2015). Appropriate usage of the Internet and digital media can be enhanced through education and training and is considered an important skill across the disciplines (Litt, 2013). Advanced digital literacy has been linked to academic performance in positive ways, and the ability to scrutinize information sources is an important factor for academic success. Leung and Lee (2012) found that those with advanced literacies in locating and accessing resources were critical of the sources and contexts of information and performed higher academically. It seems clear that fostering these literacies in our learners can benefit their own knowledge management practices.

Educators who direct learners to specific resources play a key role in facilitating access and should be explicit about the sources of various learning materials, as well as the possibilities for reusing and retaining various learning materials, and the conditions for reuse and retention. In designing a course and selecting the appropriate resources, educators direct how resources are to be accessed — for example, as physical or digital objects. In choosing the type of material to be used, they also should consider the ways in which it can be accessed. For example, online resources that can only be accessed while on a computer connected to the Internet require each learner to have ongoing access. Educators should consider how resources are retrieved, to accommodate and facilitate persistent access. Ongoing access may also be important, as learners may want to retain the use of their learning resources beyond the course duration. Where online resources are used and account registrations or subscriptions are required, educators should consider the total cost to the learner. This cost may be monetary or may require them to provide personal information to the website where they are accessing their materials. Finally, access can be considered in terms of what a learner can do with the resources — for example, adding markup and annotations to the resource — thereby potentially enhancing learning and allowing them to add contextually significant information.

Most often, educational materials are selected and recommended by the teacher. While traditionally, these have included textbooks, those are now supplemented with web resources provided to learners. Web resources may be presented to learners through a learning environment such as a learning management system (LMS), which most often requires learners to log in to gain access to these materials. Learners can be asked to access educational materials in various formats and through various access points. Table 1 distills several of these formats and access points and considers the prerequisites, costs, sustained access and ability for a learner to freely annotate, highlight or mark up a resource to support their learning.

Table 1. Types of educational materials and implications for access

ACCESS TYPE	PREREQUISITES	COST TO LEARNER	ONGOING ACCESS	ABILITY TO ANNOTATE OR HIGHLIGHT
Learners are requested to purchase a printed textbook	Textbook is available to purchase	Purchase price of book	Learner retains book	Yes, learner owns material
Learners are provided access to a textbook for duration of course	Textbook is available at school	None	Not available if book is returned	No, school owns material
Learners are provided with handouts/ copied material	Printing available	None	Learner retains printed/copied material	Yes, learner owns material
Learners are requested to access a proprietary web resource	Technology in place to support access	Cost to access resource, subscription, or exchange of personal data	Depends on web resource	Depends on web resource and format limitations
Learners are requested to access an openly accessible web resource	Technology in place to support access	None	Learner can access web resource as long as it is available	Depends on web resource and format limitations
Learners are requested to access OER	Technology in place to support access	None	Learner can access web resource and download	Depends on OER and format limitations
Learners are provided with OER printed/ copied material	Printing available / resource is printable (not audio, video, etc.)	None	Learner retains printed/copied material	Yes, learner owns material

As illustrated in Table 1, the type and format of resource that is selected for a course has implications for our learners in terms of the prerequisite infrastructure and hardware, the financial burden, ongoing and sustained accessibility, and the ability to annotate or highlight the materials to support their learning. This should be considered by those with the authority to determine the resources to be used in an education experience, as educators do have the ability to facilitate access by considering these implications. In many cases, the format of the resource determines how the materials may be accessed — for example, videos, interactive websites, etc. require access to a computer or mobile device, and the experience on each of those digital devices may differ widely. The cost to access a resource may be represented by the cost of the material, the device required to access it, personal data used for marketing purposes, the cost of Internet use, or printing costs. Furthermore, sustained access to materials should be considered — for example, is the material owned, rented or only available online? Lastly, can learners add context to their learning materials by adding annotations, highlights, and personal notes? As demonstrated in Table 1, OER often provide the most liberal access for learners, especially when offered in both printed and digital forms. These resources come at zero to minimal cost, are retainable by the learner, and freely offer the ability to annotate and contextualise the resources as needed.

METHODOLOGY

The purpose of this report is to assess students' access to educational materials in select institutions within Commonwealth countries. A questionnaire was designed and aligned to three research questions:

- ◆ How do learners' reported access to and use of information and communication technologies impact their access to educational materials?
- ◆ How do perceptions around the cost and availability of textbooks impact their access to educational materials?
- ◆ Are learners being assigned and/or are they interacting with OER, and what level of awareness do learners have around OER?

The student questionnaire consisted of 32 questions (see the appendix). The first few address basic demographics and details around their programme of study. The second section addresses access to and use of information and communication technologies. The third section contains questions around the accessibility of and practices in accessing educational materials, and learners' awareness of OER.

The questionnaire was distributed in to contact persons in select Commonwealth countries where COL's Technology-Enabled Learning initiative has partnerships: Bangladesh, Fiji, India, Kenya, Malaysia, Papua New Guinea, Saint Lucia, Samoa and Uganda. Contact persons in these countries distributed the survey instrument in their respective institutions. The majority of the survey respondents resided in Bangladesh (583), with a minority of respondents representing other Commonwealth countries: Barbados (1), Fiji (12), India (43), Kenya (47), Malaysia (11), Papua New Guinea (37), Saint Lucia (53) and Uganda (43). Given the low response rates from some of the countries, it was decided to analyse only data from countries with more than 30 responses.

RESULTS

Demographics and student characteristics

In total, 813 responses to the survey were subject to analysis after removal of responses from countries where fewer than 30 responses were received. With regard to gender, 41% of participants identified as female, 58% as male, and 1% did not provide an answer. All respondents who participated were at the time enrolled in post-secondary education programmes in their home country, with 87% reporting as undergraduate, 12% as graduate or postgraduate, and 1% in research roles. Many respondents (66%) were in the 21–25 age range, while 25% were below 20, 3% were 26–30, 2% were between 31 and 35, and 3% were 36 years or older. A summary of the year of study and primary modality of study is presented in Table 2.

Table 2. Participant year and modality of study

MODALITY	Y-1	Y-2	Y-3	Y-4	Y-5	N/A	TOTAL
Blended (some components done online)	7%	8%	3%	4%		1%	23%
Completely online	1%	1%		1%			3%
Traditional face-to-face	21%	20%	11%	18%	1%	1%	72%
No answer	1%			1%			2%

Device ownership, access and use

Respondents shared their current and planned ownership of a computing device, as represented in Figure 3. Nearly all of these respondents to this question had access to a smartphone device (98%). As well, those reporting ownership of laptop computers was high (74%), desktop computer ownership was lower (56%), while intention to purchase was higher for desktop computers than for laptops.

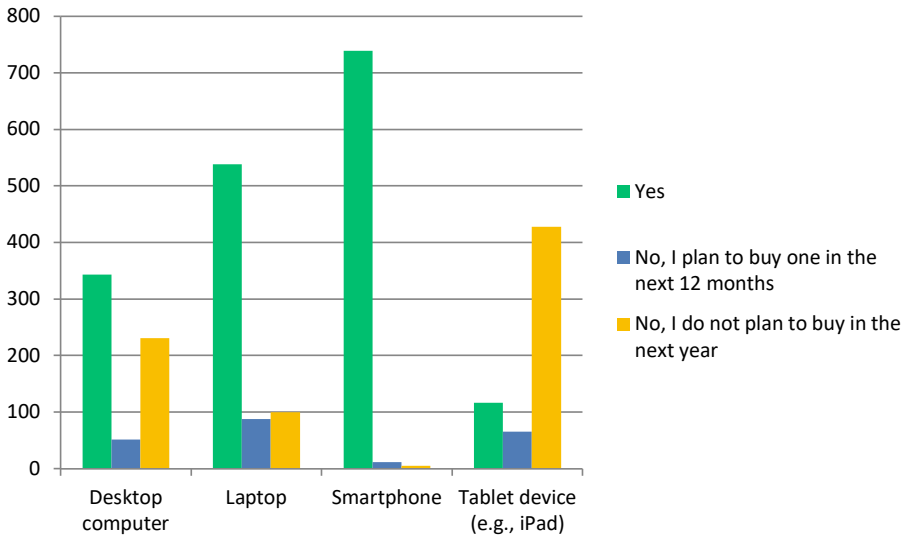


Figure 3. Device ownership among participants

Respondents were further asked which devices they most frequently used to access the Internet for studying. Overwhelming, respondents noted that smartphones were the most frequently used device, followed by laptops and desktop computers, as represented in Figure 4. Tablets were used minimally by participants for accessing the Internet when studying.

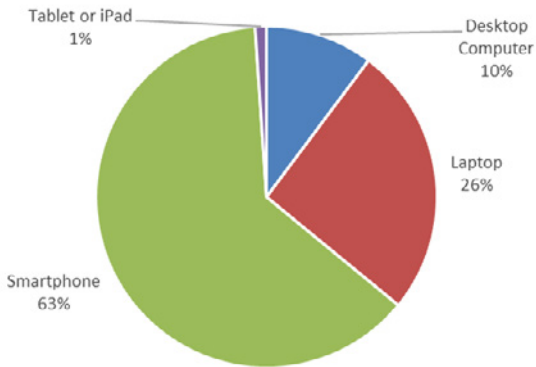


Figure 4. Most frequently used device to access the Internet for studying

When considering Internet availability, participants were asked where they access the Internet. Respondents most frequently reported Internet access being available at their home and school, with fewer reporting access at an office, presumably as many were full-time students. Access through Internet cafés was less frequently reported, as can be seen in Table 3.

Table 3. Internet access location by country

COUNTRY	HOME	SCHOOL	OFFICE	INTERNET CAFÉ	DO NOT ACCESS
Bangladesh	93%	27%	7%	11%	1%
India	84%	40%	16%	9%	0%
Kenya	51%	57%	15%	30%	6%
Papua New Guinea	59%	57%	14%	0%	3%
Saint Lucia	94%	81%	28%	21%	0%
Uganda	72%	49%	65%	26%	2%

Types of learning resources assigned

Respondents were asked to indicate the types of resources that were being assigned as part of their coursework. Figure 5 shows the occurrences of each resource type assigned. The greatest number of respondents indicated that freely available online textbooks were being assigned as part of their studies, with 376 respondents reporting these materials were assigned. This was followed by printed textbooks, with 286 participants reporting these materials being assigned. An additional 191 participants reported being assigned freely available online resources and websites; 124 reported being assigned freely accessible online digital learning environments such as Moodle or Blackboard; 91 reported having purchased access to digital textbooks; and 63 reported being assigned, at a cost, digital learning environments offered by publishers.

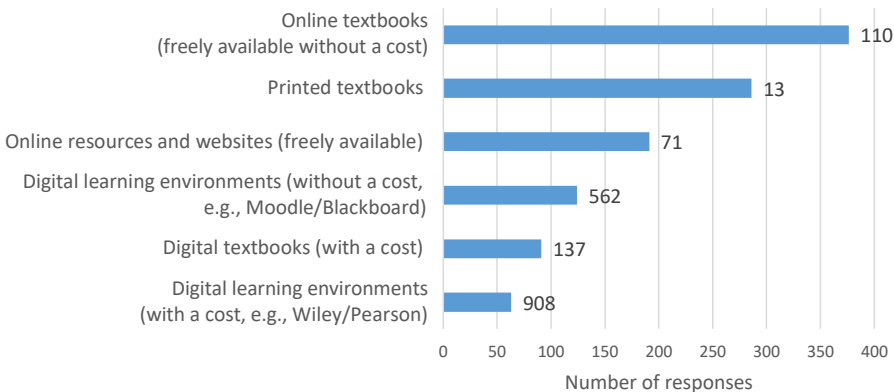


Figure 5. Average number of resources assigned, by type

Respondents were also asked to indicate the number of resources assigned, by type, as part of their studies, also indicated in Figure 5. This question was problematic in that counting the number of something like online resources in comparison to physical texts is subject to interpretation, as evident in the data. While textbooks may be discreetly counted, counting the number of online resources is more subjective, as learners may count the number of webpages, number of websites, or specific number of individual learning objects used. However, the findings clearly indicated a mix of both online and print-based resources.

While many resources may be printed on demand, some are unlikely to be appropriate for printing due to their technical formats — for example, online videos or interactive applications. Respondents specified their preference for online resources, with 57% indicating they preferred learning with digital materials over traditional printed texts, 25% preferring printed materials, and 18% reporting no preference. In Table 4, these responses are presented in relation to the most commonly used device that participants reported using for studying.

Table 4. Digital versus print materials by primary device used for study

Preference for digital versus print materials relative to the most commonly used device for study	DESKTOP	LAPTOP	SMART PHONE	TABLET/ IPAD	TOTAL
Prefer digital materials MORE than traditional printed texts	5%	15%	36%	1%	57%
Prefer digital materials LESS than traditional printed texts	3%	7%	15%	0%	25%
Have no preference	2%	4%	12%	0%	18%

Patterns of access to proprietary resources

In total, 46% of respondents reported that they had at one time or another decided against buying the prescribed educational materials because they were too expensive. Of those who did not purchase the textbook due to cost, 58% reported being somewhat or significantly concerned that this would have a negative effect on their grade in the course. Of those who had never avoided purchasing a textbook due to cost, 19% of respondents indicated that this was because they were somewhat or significantly concerned that this might hurt their grades. These data are presented as a treemap chart in Figure 6.

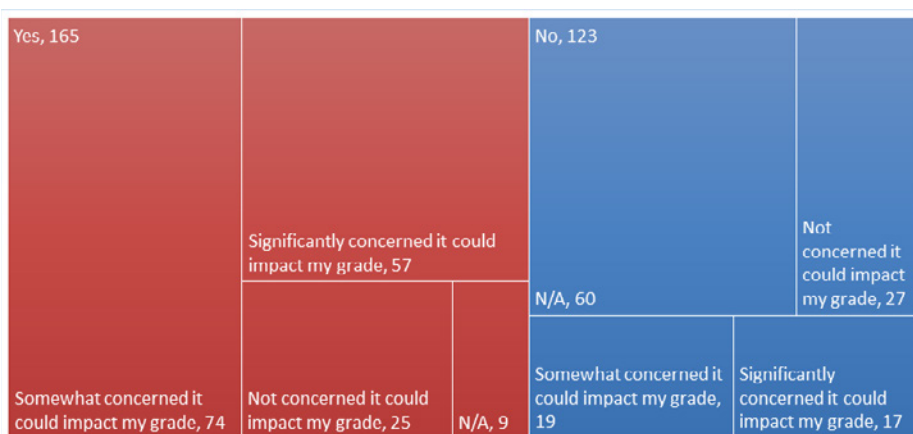


Figure 6. Participants who chose not to purchase textbooks due to cost, with rationale

Where textbooks had been assigned, participants reported the ways in which they accessed the material. Figure 7 shows the frequency of reported means of access: purchasing new, renting online, locating online, accessing through their library, purchasing used copies, or going without the assigned resource.

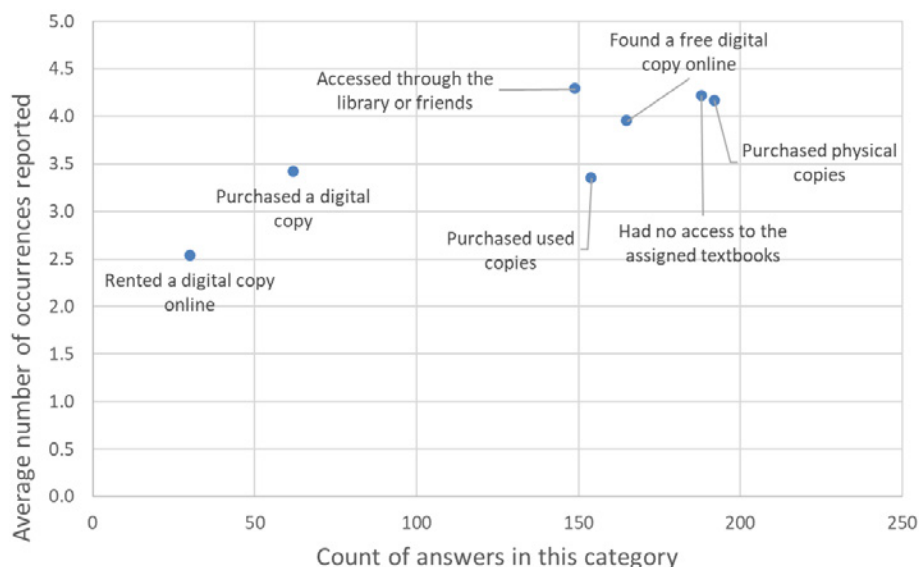


Figure 7. Access choices and average number of resources accessed

The total cost of all of the educational materials prescribed in an academic programme also had an impact on learners’ decision to enrol. In total, 62% of respondents reported that the perceived costs associated with learning materials

in an academic programme had a significant impact on their decision to study a particular discipline. Contrary to this, respondents reported that the costs associated with an individual course had less of an impact on their decision to enrol, with only 38% reporting that course-based material costs could impact their enrollment. This may be a result of programme requirements where individual courses are not optional and thus learners have less autonomy in choosing which courses to avoid. In any case, learners indicated they were more likely to consider the total cost of materials associated with an academic programme as a consideration over individual course costs.

Spending on learning materials

Each respondent was asked to indicate how much, on average, they spent on educational materials each year. Responses were indicated in the home currency for each participant and converted to USD using the World Bank’s purchasing power parity conversion rate¹ (Table 5). For the average calculation, low and high outliers were deleted.

Table 5. Average reported spending on learning materials

COUNTRY	AVAILABLE RESPONSES	AVERAGE IN USD
Bangladesh	157	125.81
India	15	268.13
Kenya	11	207.02
Papua New Guinea	7	224.88
Saint Lucia	13	338.69
Uganda	13	266.89
Average		164.34

Figure 8 shows the average reported spending on learning materials per country as a box and whisker chart, which identifies the upper and lower quartiles as well as the outliers within the data.

¹ <https://data.worldbank.org/indicator/pa.nus.ppp>

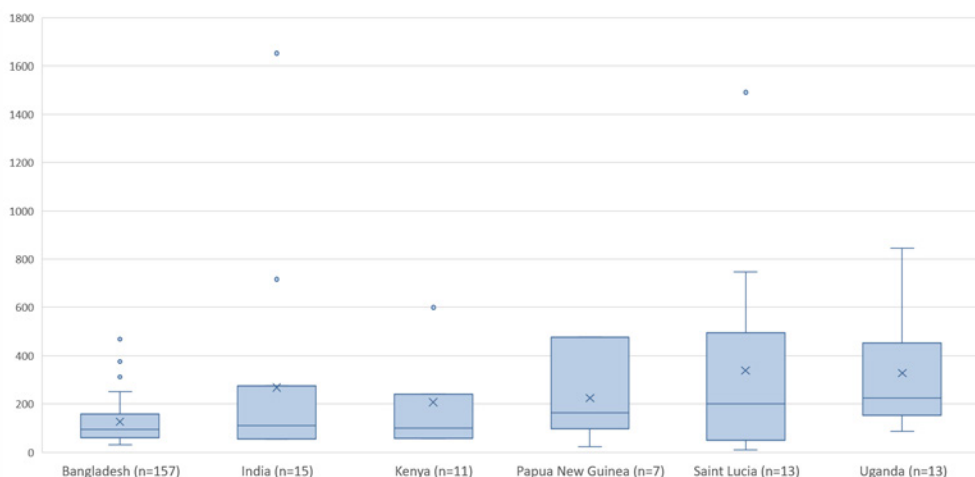


Figure 8. Box and whisker plot displaying reported spending on learning materials (USD)

While the numbers of responses for some of the countries were quite low, these figures do provide some insight into the average spending by each student in these Commonwealth countries. Overall, respondents reported spending, on average, USD 164 when converted from their home currency. Responses included several outliers, largely on the higher side of estimates per total cost, indicating that there were significant variances in the reported expenditure.

On the topic of learning material costs per course, a majority of respondents indicated that courses making use of OER or freely available learning resources should be explicitly indicated to learners when making enrollment choices. Equally, a large majority of respondents indicated that the cost of learning materials should be made clear up front, to avoid the hidden costs often discovered in the first week of the school term. Only half of respondents indicated they would like to see the course material costs included as part of tuition. Figure 9 provides a summary of learner responses to these questions.

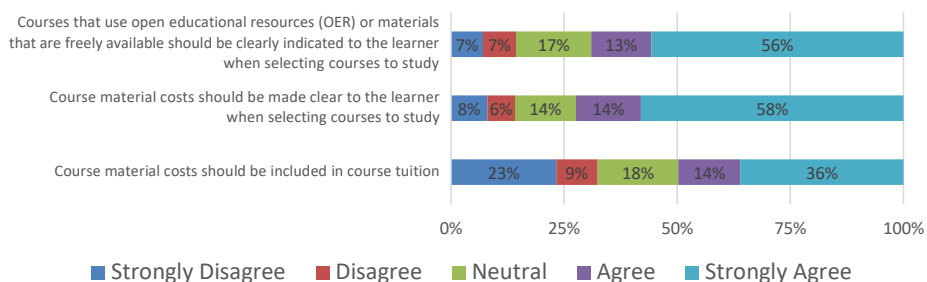


Figure 9. Resource costs as part of the course selection process

Preferences for different types of learning materials and ways of interacting with them

Turning to the types of educational materials that learners valued most, respondents indicated the types of materials they most often sought out to support their learning. Books were most frequently reported as being sought out all of the time, followed by applications and mobile apps, videos, Wikipedia articles, dictionaries, multimedia and graphics, all of which were reported to be sought out “always” or “often” more than 50% of the time. Answers to this question are summarised in Figure 10.

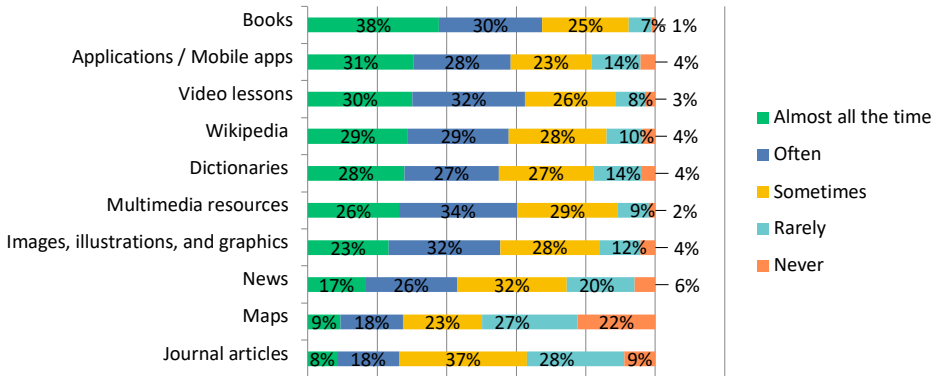


Figure 10. Types of learning resources most commonly sought

When asked how often they were able to locate resources in each category, participants reported they were most often able to find videos, Wikipedia entries, dictionaries and books. Responses to this question are summarised in Figure 11.

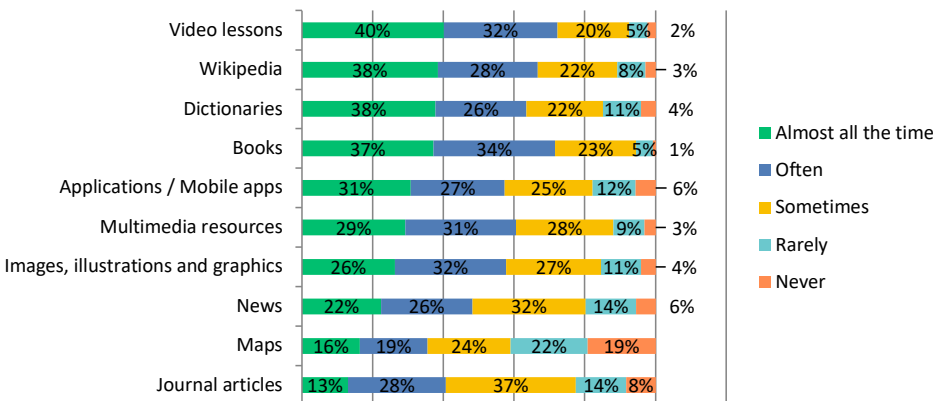


Figure 11. Success in finding relevant learning resources online

While learners are most often seeking books and apps, they report less often being successful in finding resources in these categories all or most of the time. This can be seen by comparing Figure 10, which shows the types of materials most valued, and Figure 11, which shows the types of materials most often located when searching online.

Respondents were also asked what they wanted to be able to do with their learning materials; the responses to this question are represented in Figure 12. Learners in this study seemed to value being able to interact with their learning resources in various ways, with annotation, search and copy gaining the most attention from respondents.

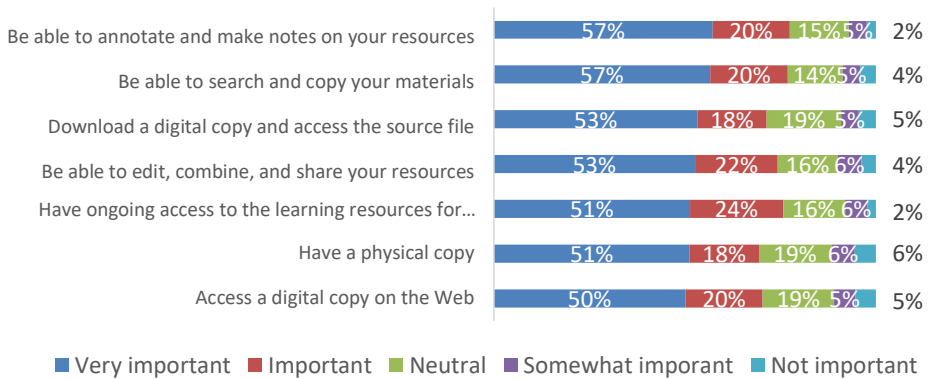


Figure 12. Preferences for interacting with learning materials

In total, 95% of respondents reported having downloaded and saving a file from the web for future use. These included a variety of file types; most frequently reported was PDF files, followed by images, videos, screenshots and Office documents. Less frequently reported included copied text from the Web, HTML/webpages, audio files and datasets. Both the number of respondents and the percentage of those who responded for each media type are displayed in Figure 13.

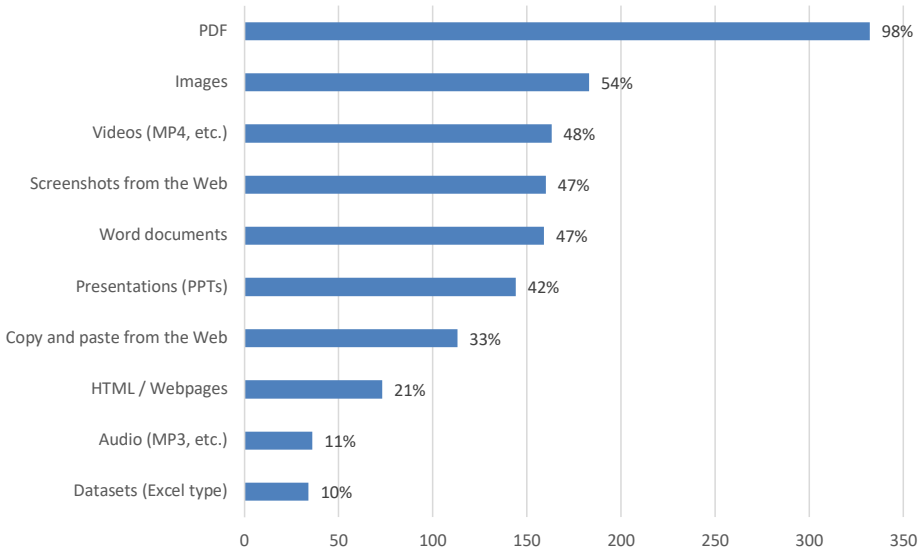


Figure 13. Types of materials most often downloaded by number of responses and percentage of those that answered in each category

When asked about concerns regarding copyright, 74% of respondents indicated they were significantly or somewhat concerned when downloading materials, while 19% reported being unconcerned, and 8% reported being unaware of copyright.

Awareness and use of OER

Respondents were asked about their awareness of OER, which included the following definition: open educational resources are teaching and learning materials available freely (without any cost) with an open licence to allow anyone to reuse, adapt and redistribute them without the permission of the copyright owner. In response, 37% indicated an awareness of OER, while 63% indicated being unaware of the term. Of those reporting an awareness of OER, 39% indicated they considered them of better quality than traditional resources, 52% reported them of equal quality, and 9% reported them of lower quality. Those aware of the term were asked to provide three examples of OER that they most frequently accessed. Of the 151 recommendations offered, only 28 could be identified as actual OER (Table 6). Respondents most frequently referenced specific types of multimedia, general websites, Google services, physical resources, academic journals, social networks, MOOC platforms, app stores, paywall sites or course materials. Note that only 59 of the 125 respondents who claimed to be aware of OER provided an answer to this question.

Table 6. OER referenced by respondents

OER REFERENCED	REFERENCES
GeeksForGeeks	5
Khan Academy	2
Merlot	1
MIT OCW	2
OER Africa	1
OER Commons	3
Open textbooks	1
Open University UK	2
Wikipedia	11

The responses from the countries in this study show that learners lack awareness about OER and what might be classified as an OER. Many of the resources listed were those that may be found online and are freely accessible, but not necessarily licensed for reuse, adaptation, or remix, as is characteristic of most OER. It is interesting to note that several services that may be used to share OER were referenced by participants — for example, Google content delivery services, social networks, or LMS environments. This indicates a further misunderstanding about the differences between OER and the networked technologies used to access these materials.

DISCUSSION

The purpose of this study was to assess students' access to educational materials in select institutions within Commonwealth countries. The following discussion aims to address each research question that guides the study.

How do learners' reported access to and use of information and communication technologies impact their access to educational materials?

In addressing the first research question — how do learners' reported access to and use of information and communication technologies impact their access to educational materials — one significant finding is that learners are increasingly using their smartphone mobile devices for accessing learning materials. Furthermore, nearly all respondents reported having access to a smartphone. A complicating factor in terms of smartphone use for accessing learning materials is the increasing diversity of learning resources that learners are being asked to review as part of their studies. They are being assigned a diversity of resources, including printed texts, digital texts, web resources, online learning environments, and publishers' learning environments, creating a complex landscape for access and use. With an increased diversity of learning resources being assigned to learners, it is important for educators to consider accessibility when assigning learning resources as part of a course. This may include considering the use of captions and transcript files for audio and video resources to ensure the materials are accessible to all learners.

The increasing diversity of learning resources also creates complexity for learners in that resources may not all be shared in a single location. This emphasises the need for learners to engage in explicit curation of their educational materials, whether they are online, print based, password protected or limited by DRM. In addition to the materials assigned as part of their study, learners reported seeking out a variety of additional resources to support their learning. Many of these include emergent forms of media, such as educational applications, videos, Wikipedia entries, and a variety of multimedia. These resources also need to

be curated by the learner so they can be accessed and reviewed when needed. Educators may consider ways that learners can contribute these resources back to the class community to enhance the learning of others and provide resources for discussion.

As learners have increasingly ubiquitous access to the Internet and mobile devices, they are seeking more interactive content in the form of interactive applications and yet report being able to find these types of resources less often than other web resources such as video, dictionaries, Wikipedia entries and books. For those who report preferring printed materials to support their learning, the diversity of increasingly online learning materials, including those not suitable for print, may serve as a barrier to their learning.

Participants in this study reported significantly high access to smartphones, so creating mobile-friendly interactive learning materials is a promising approach for developing learning materials. However, these resources must be designed with accessibility in mind, allowing learners to curate and control access to the needed learning materials, use them while they themselves are mobile, and in some cases work without Internet connections. The incremental movement towards using an LMS to store resources that are difficult to download, or even more recently within LMSs controlled by publishers and made available for short durations, represents a challenge to the needs of learners, who should be able to download, annotate, remix, and combine their resources offline and into the future.

How do perceptions around the cost and availability of textbooks impact access to educational materials?

In exploring respondents' perceptions around the cost and availability of textbooks and how these impact their access to educational materials, it was evident that the increased availability of free online alternatives to purchased textbooks were of interest to learners. While the cost of a textbook for a particular course did not have a significant impact on their decision to enrol in that course, it was interesting to find that learners do look closely at the total additional cost of learning materials for an academic programme of study. Notably, learners indicated they were more likely to consider the total cost of the programme as a consideration over individual course costs. This is positive news for new OER-based programmes, such as the z-cred or zero-cost programmes that aim to have zero additional costs associated with learning materials.

Participants suggested that the present cost, an average of USD 164, is not a significant barrier to their learning, although learners did express a preference that course material costs be included within the course/programme fee. In many cases, learners discover the total cost of the learning materials for their courses during the first week of class, and the total cost can quickly escalate, leaving learners to make very challenging decisions about which resources to buy, rent, share, borrow, copy or go without. For those who chose not to purchase a required learning resource, they widely recognise that this can put them at a disadvantage and even at risk of failure.

Are learners being assigned and/or are they interacting with OER, and what level of awareness do learners have around OER?

The ways in which respondents reported wanting to interact with their learning resources aligned well with the technical and legal affordances of OER. Respondents reported wanting the ability to annotate, search, copy and maintain copies of the source files of their learning resources for ongoing access.

Overall, this research found that learners are increasingly being assigned online learning resources, as well as seeking out and finding resources to support their learning on their own. How many of these online resources are actually OER is not entirely clear, as the difference between an online and openly licensed resource does not impact their general availability. While an open licence and open technical formats would enable learners to do even more with their learning material, it appeared that resources without explicit open licences were also considered downloadable and usable in various ways.

In terms of OER awareness, based on the results of this questionnaire, it is clear that much work still needs to be done to draw attention to OER and how to recognize them online. While awareness of the term was fairly high for a student population (37%), far fewer respondents provided examples of OER they most frequently use. Of those who did provide examples, only a small number demonstrated an understanding of OER based on the examples provided in the questionnaire. Awareness of what constitutes an OER is abysmally low, and consequently, several of the affordances made possible by OER are not being realised.

CONCLUSION

The purpose of this report was to better understand learners' access to educational materials in select institutions within Commonwealth countries. The findings suggest that increasingly, learners are working in a complex ecosystem of learning resources, some of which are prescribed by their teachers and some of which they seek out to supplement and enhance their learning. Unsurprisingly, the learners in this population nearly all have smartphone devices, which many use as their primary means to access the Internet. In light of these findings, the following recommendations may be considered by educators, learning designers and administrators. First, some careful attention might be given when considering the accessibility of the learning materials we prescribe as part of formal coursework. These could be considered in terms of: the total cost of the resource; whether alternatives are in place for learners who cannot afford their learning materials; the duration a learner will have access, especially now that rental and subscription services are becoming common; how and whether the learning resource is suitable for mobile devices; whether learners are free to mark up, annotate and add context to their learning materials; and ensuring that each resource prescribed is accessible to all learners. Lastly, considering the growth of available OER and increasing adoption across higher education, learners should be made aware of what is possible with openly licensed material. As evidenced in this study, there appears to be some confusion about what OER are, how to recognise them, where to find them, and what can be done with them. Educators using OER should make explicit the terms of open licences and provide examples of how such resources may be used by learners and the wider population.

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APPENDIX

Learners' Access to Educational Resources in the Commonwealth

The Commonwealth of Learning (COL) is conducting research into Learners' Access to Educational Resources in the Commonwealth. The goal is to understand students' perceptions with regard to access and their practices in accessing educational resources, in both print and digital forms. As you are currently a student in a Commonwealth country, we invite you to participate in this study by completing the following questionnaire.

The questionnaire will require approximately four to six minutes to complete. There is no compensation for responding, nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Participation is voluntary, and you may refuse to participate at any time.

If you have any concerns or questions about this research, please contact Dr. Sanjaya Mishra, Education Specialist: eLearning at smishra@col.org.

A. Background Information

1.1 Name of the University/ Institution: _____

1.2 Country: _____

1.4 Gender: Female Male Prefer not to reply

1.5 Your Age Group: Below 20 21-25 26-30 31-35
 36-40 41 and above

1.6 Your Level of Study: Undergraduate Graduate or Postgraduate
 Research

1.7 Year of Study: Year 1 Year 2 Year 3 Year 4

1.8 Your faculty discipline:

- Humanities Natural Sciences
 Social Sciences Engineering and Technology
 Commerce and Management Agriculture and natural resources
 Health and Medical Sciences Fine and Performing Arts

1.9 Most courses currently being studied by you are:

- Traditional Face-to-Face
 Completely Online
 Blended, where some components of the study are done online

B. Access to and Use of Information and Communication Technologies

2.1 Do you own any of these devices?

Devices	Yes	No, I plan to buy one in the next 12 months	No, I do not plan to buy in the next year
Desktop computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laptop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smartphone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tablet device (e.g., iPad)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.2 Where do you access the Internet? (✓ tick all that apply)

- Home School Office Internet café Do not access

2.3 Which device do you most frequently use to access the Internet for studying?

- Smartphone Tablet or iPad Laptop Desktop Computer

2.4 What types of learning resources do you most commonly seek out related to your subject of studies?

Type of Resources	Almost all the time	Often	Sometimes	Rarely	Never
Books	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Journal articles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Images, illustrations and graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
News	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dictionaries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wikipedia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multimedia resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applications / Mobile apps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.5 How often are you successful in finding relevant learning resources online?

Type of Resources	Almost all the time	Often	Sometimes	Rarely	Never
Books	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Journal articles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Images, illustrations and graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

News	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dictionaries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wikipedia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multimedia resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applications / Mobile apps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.6 What are your reflections overall on using online learning resources versus printed texts?

- I like learning with digital materials MORE than traditional printed texts.
- I like learning with digital materials LESS than traditional printed texts.
- I have no preference.
- Other/comments _____

C. Access to Educational Materials and Awareness of Open Educational Resources (OER)

3.1 How many of the following educational resources were you assigned this year/term?

Printed textbooks _____

Digital textbooks (with a cost) _____

Online textbooks (without a cost) _____

Digital learning environments (with a cost – e.g., Wiley/Pearson) _____

Digital learning environments
(without a cost – e.g., Moodle/Blackboard) _____

Online textbooks (freely available) _____

Online resources and websites (freely available) _____

3.2 Of the textbooks you were assigned this year/term, indicate how you accessed them:

Access to Textbooks	Write the Number of Textbooks
Purchased physical copies	
Purchased used copies	
Purchased a digital copy	
Found a free digital copy online	
Rented a digital copy online	
Accessed through the library or friends	
Had no access to the assigned textbooks	

3.3 Have you ever decided against buying the prescribed educational materials because they were too expensive?

No Yes If yes, how many times? _____

3.4 If your response to the previous question was yes, were you concerned that not buying the educational materials would hurt your grades in the course?

Yes, significantly concerned Yes, somewhat concerned

No Not applicable

3.5 Does the cost of educational materials impact your decision to study a particular discipline?

Yes, significantly Yes, somewhat

No Not applicable

3.6 Does the cost or requirement of purchasing educational materials impact your decision to take a specific course?

Yes No

3.7 Please indicate your level of agreement with the following statements:

Course material costs should be included in course tuition.

Strongly disagree 1 2 3 4 5 *Strongly agree*

Course material costs should be made clear to learners when they're selecting courses to study.

Strongly disagree 1 2 3 4 5 *Strongly agree*

Courses that use open educational resources (OER) or materials that are freely available should be clearly indicated to the learner when selecting courses to study.

Strongly disagree 1 2 3 4 5 *Strongly agree*

3.8 How important is it to be able to do the following with your learning resources?

Have a physical copy

Not important 1 2 3 4 5 *Very important*

Access a digital copy on the Web

Not important 1 2 3 4 5 *Very important*

Download a digital copy and access the source file

Not important 1 2 3 4 5 *Very important*

Have ongoing access to the learning resources for future access and use

Not important 1 2 3 4 5 *Very important*

Be able to search for and copy your materials

Not important 1 2 3 4 5 *Very important*

Be able to annotate and make notes on your resources

Not important 1 2 3 4 5 *Very important*

Be able to edit, combine and share your resources

Not important 1 2 3 4 5 *Very important*

3.9 All other things being equal, do you think you would do better in a course if the educational materials were available freely online and buying a hard copy was optional?

- Yes, significantly better Yes, somewhat better
 No Not applicable

3.10 How much on average do you spend on buying educational materials in a year?

Total spending: _____ Currency: _____
(Write your expenditure on textbooks in local currency.)

3.11 What percentage of your educational expenditure is on educational materials?

- Less than 5% 5–10%
 10–20% 20–40%
 More than 50%

3.12 Have you ever downloaded and saved educational materials from the Web?

- Yes No

3.13 If your response to the previous question is yes, which types of materials do you often download? (*✓ tick all that apply*)

- | | |
|--|---|
| <input type="checkbox"/> PDFs | <input type="checkbox"/> Audio (MP3, etc.) |
| <input type="checkbox"/> Videos (MP4, etc.) | <input type="checkbox"/> Word documents |
| <input type="checkbox"/> Images | <input type="checkbox"/> Presentations (PPTs) |
| <input type="checkbox"/> Datasets (Excel type) | <input type="checkbox"/> HTML/web pages |
| <input type="checkbox"/> Copy and paste from the Web | <input type="checkbox"/> Screenshots from the Web |

3.14 Are you concerned about copyright issues while downloading materials from the Internet?

- Yes, significantly concerned Yes, somewhat concerned
 No Not aware of copyright issues

3.15 Are you aware of open educational resources (OER)?

Yes No

(**Note:** Open educational resources are teaching and learning materials available freely — without any cost — with an open licence to allow anyone to reuse, adapt and redistribute them without the permission of the copyright owner.)

3.16 If you are aware of OER, please indicate the 3 main sources of OER that you use:

3.17 If you are aware of OER, how would you rate their quality?

- WORSE than the quality of the resources in my other courses
- The SAME AS the quality of the resources in my other courses
- BETTER than the quality of the resources in my other courses

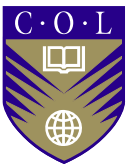
D. Comments and Feedback

Please share your views, experiences or other feedback regarding access to educational materials and/or textbooks in the context of the questions in this survey.

Note: Some questions in this instrument are adapted from:

Kirkwood, A., & Price, L. (2016). *Technology-enabled learning implementation handbook*. Burnaby, Canada: COL. Retrieved from <http://oasis.col.org/handle/11599/2363> (available as CC BY-SA).

Senack, E. (2014). Fixing the broken textbook market: How students respond to high textbook costs and demand alternatives. Retrieved from <https://uspirg.org/reports/usp/fixing-broken-textbook-market> (available as CC BY). More information at Student PIRGs <http://www.studentpirgs.org/textbooks>.



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