



Open Learning: The Journal of Open, Distance and e-Learning

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/copl20>

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To cite this article: Margaret Verkuyl , Jennifer L. Lapum , Oona St-Amant , Jessica Bregstein & Michelle Hughes (2020): Healthcare students' use of an e-textbook open educational resource on vital sign measurement: a qualitative study, *Open Learning: The Journal of Open, Distance and e-Learning*, DOI: [10.1080/02680513.2020.1835623](https://doi.org/10.1080/02680513.2020.1835623)

To link to this article: <https://doi.org/10.1080/02680513.2020.1835623>



Published online: 16 Oct 2020.



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Healthcare students' use of an e-textbook open educational resource on vital sign measurement: a qualitative study

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ABSTRACT

Students desire free textbooks that incorporate multimedia and interactive experiences. Although there is an increased production of e-textbooks, these resources tend to replicate hard copy books and do not take advantage of the functions that technology offers. There is also a shift to creating e-textbooks that are considered open educational resources. A team of nursing educators and a nursing student created an interactive open educational resource e-textbook in vital sign measurement that was implemented within the curriculum of post-secondary health-related programmes. The goal of this paper is to report the study findings which sought to explore healthcare students' experiences of using this open educational resource. Three discipline-specific focus groups were conducted with a convenience sample of 29 students. Using a qualitative thematic analysis, six inter-connected themes describing students' use of this resource were identified: (a) This Generation's Learner, (b) Vital Signs Open Educational Resource influence, (c) Accessibility, (d) Convenience, (e) Design, and (f) Visual and Other Types of Learning Styles. Participants were positive about using the open educational resource to learn vital sign skills. Our study findings provide a foundation for e-textbook design standards that support student learning.

KEYWORDS

Open educational resources; focus groups; vital signs; healthcare students; higher education; e-textbook

Open educational resources (OER) are being taken up in post-secondary education as part of a social justice initiative that offers students access to free, high-quality resources like e-textbooks. They have been created for and used in courses with programmes such as nursing, science, psychology (Hilton & Laman, 2012; Lapum et al., 2018; Van Horne et al., 2017). Researchers exploring the impact of OER e-textbooks on students found that while students appreciated the free resources, their acceptance of them diminished when they were poor quality or when they had technology issues (Benoit, 2018; Casselden & Pears, 2020; Jhangiani et al., 2018). Although there has been uptake of OER in post-secondary nursing education (Lapum et al., 2019), there has been limited research looking at students' experiences.

The goal of this paper is to report findings from a qualitative focus group study that explored inter-professional healthcare students' experiences of using our newly created vital signs OER (VSOER). It can be retrieved at <https://pressbooks.library.ryerson.ca/vital-sign/>.

Background

OER are an optimal way to make learning resources freely and pedagogically accessible to learners. With advancements in technology, OER are increasingly being used for kinaesthetic learning with individualised, adaptive tools to simulate real-life context. OER are learning resources such as e-textbooks or modules or activities that are freely used in their original format or modified and remixed (DeRosa & Robison, 2017; UNESCO, 2012). It is important to note that not all e-textbooks are OER, many e-textbooks are purchased and copyrighted so they cannot be modified or repurposed. Open licencing, often through Creative Commons, allows authors to retain copyright while granting others permission to revise, adapt or adjust the original content (Wiley et al., 2014). Open licences allow content to be revised to meet specific learning outcomes, new practices or a specific disciplinary approach to content (Wiley et al., 2014).

The uniqueness of OER allows for the development and building of knowledge through increased learning opportunities to facilitate in class and lifelong learning (De Los Arcos et al., 2014). As OER continue to increase, access to academic information becomes available to all instead of to the few that can afford it (Nick, 2011). In addition, knowledge creation, sharing and distribution in the format of OER creates a medium in which students can be co-creators (Cronin, 2017). When students are involved in the creation of learning resources, student-centred pedagogy is facilitated (DeRosa & Robison, 2017). Learning is transformed when students work together with educators to produce the OER they use in their programmes.

Despite the increased number of e-textbooks available to learners many are simply replicates of hard copy textbooks in electronic format (Gu et al., 2015). Van Horne et al.'s (2017) quantitative study exploring the use of e-textbooks in a biology course found 80% of the participants still used the hard copy textbook despite having the e-textbook. Students who used e-textbooks said the continuous reading on the screen had disadvantages such as eye strain, the linear nature and a lack of experiential learning opportunities (Casselden & Pears, 2020). A number of these challenges can be addressed by using innovative features that facilitate experiential learning and multimodal ways of learning and embedding them in the e-textbook. As educators, it is imperative to capitalise on ways to provide quality e-textbooks in higher education (Lapum et al., 2019) and develop best practices for designing them.

An advantage of OER e-textbooks is that they can meet the needs of healthcare educators who are striving to include inter-professional experiences in their curriculum. Vuurberg et al. (2019) found in their systematic review that students reported disappointing educational material in their inter-professional activity. OER developed by an inter-professional team of educators can be a way to provide free, quality educational materials that can be used by different professions. These can set the stage to create inter-professional experiences.

The VSOER e-textbook was created using a learner-centred pedagogy. It was produced by both creating content and adapting two existing OER. We selected the topic 'vital signs' because it is a foundational skill in healthcare programmes and its application lends itself to multi-model learning styles. Creating the VSOER was a collaborative, inter-professional effort made up of three groups: an authorship team, an inter-professional educators' advisory team and a student advisory team. In the Fall of 2018, at a Toronto college, the VSOER was added as a required resource in the educational programmes: Massage Therapy (MT) and a combined Occupational Therapy Assistant (OTA)/

Physiotherapy Assistant (PTA). The VSOER was used in class and students were provided with a link to the OER. In the Practical Nursing (PN) programme, the link was provided to students as an optional resource. It is important to note students were evaluated on their practical performance of vital sign measurement in these programmes.

Study purpose

The study purpose is to explore students' experiences using the VSOER in three health study programmes. Specifically, we used focus group methods to better understand how students in MT, OTA/PTA, PN programmes interact with the e-textbook and its perceived utility on their learning. Ethics approval was obtained from the college's Research Board of Ethics (file # 2018/19-01) and participants signed consent before participating in the focus group.

Methodology

A focus group method was used, which facilitates a collectivistic and multivocal approach to involve groups of people and multiple individuals' experiences of a particular phenomenon (Liamputtong, 2011). Additionally, focus groups allow for observation of interactions among participants (Morgan, 2002).

Convenience sampling was employed. An announcement was posted in the course learning management system for health programmes including: MT, OTA/PTA, and PN. Research staff also attended these classes to make an in-class announcement about study participation. Interested students were invited to contact the research staff about further information to participate. We aimed to recruit 6–12 students from each group for a total of three focus groups.

The moderator facilitated the focus groups using an interview guide of open-ended questions to allow for organic discussions (Liamputtong, 2011). See [Table 1](#) for the focus group question guide. The moderator, a faculty member from another programme, facilitated the dialogue. The focus groups were audio-recorded and lasted 45 to 60 minutes in duration.

The digital files were transcribed and checked for accuracy. The research team individually reviewed printed copies of the transcripts followed by an in-person team meeting that employed Braun and Clarke (2006) approach to thematic analysis. Thematic analysis involves identifying codes that answer the research question and then, grouping these codes into themes, which represent a pattern. At the group meeting, one member read the transcripts line-by-line aloud. We then used an inductive approach of coding and engaged in dialogue until the team agreed on the coding structure. Following that we looked for patterns and categorised codes within a theme. The process was iterative allowing for the definition, and then redefinition of themes to clearly represent the different codes. In addition, our team took time to review the identified themes individually and then regrouped at a later date to validate them. This team process provided the framework for a reflexive analytic method in which all the authors were actively engaged in the discussion increasing the rigour in the analytic decision-making (J.L. Lapum et al., 2015).

Although we used a simple descriptive qualitative approach, we still situate this work within social constructivism and therefore ontologically believe that multiple realities exist

Table 1. Focus group question guide.

Focus Group Question
Tell me about your experience using the open educational resource e-textbook entitled Vital Signs Across the Lifespan.
How did you find the flow of information in the open educational resource e-textbook entitled Vital Signs Across the Lifespan?
How useful were the interactive activities included in the e-textbook Vital Signs Across the Lifespan in affecting your learning?
Were there any challenges or benefits to using the open educational resource e-textbook entitled Vital Signs Across the Lifespan?
How were your experiences of accessing and using an e-textbook?
How would you compare the Vital Signs Across the Lifespan e-textbook to traditional textbooks?
What recommendations do you have for us related to the open educational resource e-textbook entitled Vital Signs Across the Lifespan?

and are socially constructed. Stemming from this worldview is the belief that evidence is mediated by interpretation and meanings. Therefore, this work is not intended to be prescriptive or taken up as ‘truth’ but is rather a representation of our interpretation of data. Our chosen methodology values richness and meaning to describe the experience.

Study results and analysis

The study sample included 29 students who participated in three discipline-specific focus groups consisting of MT (n = 9), OTA/PTA (n = 8) and PN (n = 12). Most of the participants were women (n = 25) between the age of 18–25 (n = 19) and a few participants over the age of 35 (n = 4). The majority of the participants had previous experience using e-textbooks (n = 25) and approximately half had completed another degree (n = 14). The analysis yielded six themes: (a) This Generation’s Learner; (b) VSOER’s Influence; (c) Accessibility; (d) Convenience; (e) Design; and (f) Visual & Other Types of Learning Styles. Under each of these themes, two to five codes are discussed (see Table 2).

Table 2. Themes and subthemes.

Theme	Subtheme
This Generation’s Learner	Default learner Technology-related learner
VSOER’s Influence	Depth of knowledge Self-evaluation Anticipating issues Selection of tools
Accessibility	Pace Portability
Convenience	Navigation Efficiency Repetition
Design	Layout of text Format Voice Versions
Visual & Other Types of Learning Styles	Multi-modal experience Prominence of visual learning styles Learner engagement Memory retention Class preparation and application

This generation's learner

Generational learning emerged as an important theme, as participants compared traditional learning formats to the multi-modal nature of this VSOER. Subsumed in this theme were two codes: default learner and technology-related learner which further explicated the role of generational learning as an important feature of good pedagogy.

Default learner

Default learner referred to the methods that come naturally for today's students in their pursuit of knowledge. In other words, their 'go-to' search strategies for finding information and learning. For example, participants commented on previously accessing demonstration videos and YouTube videos to solidify their knowledge before having access to this VSOER. They had become accustomed to supplementing their classroom knowledge in this manner, stating, *'there's more things that they do in the video than, like, what they tell us to do in lab'* so that *'when I go and watch the video and I do my [own] demonstration. I find myself knowing a lot more'* (PN). The default learner values easily findable, bite-size information. Referring to this VSOER, participants noted the importance of simplicity when accessing information, *'I like how it shows the chapters and then, like, you can go into something instead of scrolling through the whole entire textbook trying to find what you're looking for, so, it's convenient to use'* (MT). Some participants even recommended making the VSOER more easily accessible, by *'a barcode you can scan and then it takes you to a video'* (MT). They were willing to pay for this convenience with one participant indicating *'I don't like buying textbooks to be honest because they are like, mad expensive, but I'd actually get this one'* (MT). Agreeably, another participant affirmed this notion *'because I really like ebooks ... then I don't have to google for videos'* (MT).

Technology-related learner

Technology and its application in learning emerged as an important feature of what defines the VSOER as relatable for today's learner. One participant commented if I were *'to read this textbook [points to traditional paper copy] versus your textbook, and give me like 15 minutes to learn how to take blood pressure, I'd probably learn faster from that [VSOER]. It's like straight to the point'* (MT). Several participants commented on how the VSOER is emblematic of their generation, noting *'I'm the e-textbook, and the [traditional] textbook is my dad ... the textbooks you see now are just so prehistoric like they're not evolving with time'* (MT). Another participant felt the VSOER transcends generational learning, stating *'all ages can use it, like, we're a generation that grew up with technology, so for us, it's not that difficult but for, like, my parents, for instance, could even navigate this, it's so simple'* (MT). Furthermore, technology served as a requirement for future progression, as one participant noted *'everything is going online nowadays and that's kind of the future of everything, it's going to be apps, it's going to be phone stuff'* so in health care if you need to check something you *'have all your information at hand, that's a big advantage'* (OTA/PTA).

VSOER's influence

The focus group data yielded important revelations about the VSOER's influence, the various ways in which students learned and solidified knowledge. Subsumed under this theme were four codes: depth of knowledge; self-evaluation; anticipating issues; and selection of tools.

Depth of knowledge

Several participants remarked on how the combination of features in the VSOER positively influenced their knowledge. What became clear from this data was that participants have multiple complex needs, and resources need variety to address such complexity. One participant specifically noted the mixture of text and activities were important for enhancing their critical thinking capacity, stating *'it made me think critically about what the activity is itself'*, for example:

if you take a mismeasurement, then you know, instead of saying 'oh well that was not the right measurement, try again,' it was like well maybe it's because of this and this and then you start thinking a little bit deeper into what it really means to take that measurement so I really liked those activities because it forced you to think a little bit deeper into the topic and then maybe go into another section of the textbook and educate yourself a little bit more on certain things that you might not have thought about otherwise (OTA/PTA).

Other participants noted the depth of information as suitable for their learning since it provided *'more details compared to, in the actual, workbook and what we're actually given. It just, explained it better'* (PN). Affirming the depth of information, another participant remarked *'it went step by step, what you should do, how your interaction should be, what are the first things you need to look for, what not to look for, what not to do'* (PN). Creating content that meets students' need for depth of knowledge was important, as one participant noted *'you read it, you watch it being done or you watch the technique, and then you're like "oh okay" so now I understand'* (OTA/PTA). Reviewing the VSOER before class resulted in richer class learning as a participant voiced, *'the physical part of it had already been covered in the e-textbook so I was able to focus on the additional information the professor brought to the table'* (OTA/PTA).

Self-evaluation

Participants discussed how the VSOER influenced their desire to self-evaluate in order to make determination about their progress in learning and ultimately, their readiness for practice. One participant's remark was echoed by others in terms of how the VSOER provided interactive activities and questions *'to test myself'* (PN). Another participant elaborated that quizzes *'helped me understand how much I understand from the material'* (MT). Another participant felt the VSOER served to confirm their steps/approach, stating: *'I like that it [checklist] was in the textbook because it sort of reflects what I already do. So, it was really helpful so then I can incorporate that checklist into my own mental checklist'* (OTA/PTA).

Anticipating issues

The VSOER features, such as finding the errors activity, influenced their capacity to anticipate issues. One participant said they liked the error activities *'because some textbooks they just tell you like, "oh this is the activity, do it", but they don't really tell you what could go wrong and how you can improve'* (OTA/PTA). Another participant expanded, *'it's important to know the errors because in real life you're never going to do everything perfectly, right? So, you need to know how to troubleshoot'* (OTA/PTA).

Selection of tools

A final subtheme of VSOER influence was the multiple selection of tools offered in this VSOER. Participants reflected on the importance of having variety in the learning process and the value of going beyond textual formats. One participant noted, *'just reading a textbook, like, page by page, word by word, right? Because then at least with the interactive part you're more engaged that way you're actually recalling information'* (OTA/PTA). Another participant remarked how the multiple selection of tools was *'good'* because *'it reinforced in different parts'* (OTA/PTA).

Accessibility

The theme of accessibility was important to these digitally aware learners. Two codes emerged in the data including: the pace and portability of the VSOER.

Pace

It was evident that individual learning needs were met by being in control of the pace of learning. Pace of learning was particularly highlighted in the use of videos with a participant explaining, *'in class it's all over in two seconds ... At least the video stop, start, there's no one really telling you like, oh let's keep going, you're learning at your own pace'* (MT). Another participant elaborated that being able to control the pace of the videos enhanced their learning, *'I would probably pause and then, try to understand'* (MT). Pace was also related to the evaluation of learning where participants felt, *'just doing a little bit of questions and I'll see how I'm doing, if I'm doing them all wrong, reread something'* (MT).

Portability

The portability of the VSOER allowed for easy, convenient access of information. Participants felt it was an advantage to be able to access the VSOER on their phone so that *'if you are on the bus, like, going from place to place and it's just easily accessible'* (MT) and it allowed the participant to *'do homework with my phone'* (MT). When compared to a regular hard copy textbook, the VSOER was convenient since, *'you don't have to lug around a big heavy textbook'* (OTA/PTA). Another option that participants appreciated was being able to *'print out'* (MT) specific items like the flashcards and have the documents available for easy reference.

Convenience

The VSOER was convenient to use with information retrieved easily for instant access. The codes that fell under convenience included: navigation; efficiency; and repetition.

Navigation

Navigation was enhanced by the ability to click on a chapter, expand it to the subcategories, then click on the desired content. A participant said, *'I thought it was very organized ... there was subcategories for each chapter so when referring back, you don't have to flip through all these pages to find one thing, you can just go straight there'* (OTA/PTA). Another participant added *'even someone who doesn't have that much computer knowledge could access it because it's pretty straight forward'* (OTA/PTA). Ease of navigation was enhanced by using the online version as one participant said, *'you can find things a lot easier with like the control F function versus like a textbook where you have to physically remember or go to it line by line and try to find what you're looking for'*.

Efficiency

Efficiency was facilitated by the VSOER's organisation, as well as the type and amount of content in the VSOER. For example, when doing the test questions, *'the first page was just the questions and the second page showed the answers'* then if you need more information you *'just click and find the information'* (OTA/PTA). Once participants accessed the information, they found it to be concise with an *'elabora[tion] on what you needed to know and not too much of what you didn't need to know'* (PN). Concise text was seen as important in the VSOER since too much text is *'overwhelming'* (PN). As a result, learning was more efficient with a participant stating, *'I'd probably learn faster from that, it's like straight to the point'* (MT).

Repetition

The subtheme of repetition was specific to the videos embedded in the VSOER. The function to repeat the video created an ability to conveniently access information to master a technique. The participants went *'right back to a spot'* to watch it again so they *'didn't miss anything'* (MT) or to *'write down like the most important information that I actually need to know'* (MT). Repetition was important to mastering a skill with a participant explaining, *'when you only see it once [such as in class] you're focusing on like what the hands are doing you're not focusing on all the 10 other variables that are going on'* (MT).

Design

The design theme emphasised the overall structure and impact on students' engagement with the VSOER. The codes within this theme included: layout of text; format; voice; and versions.

Layout of text

The structure regarding the layout of text within each chapter was observed by the participants. One participant commented, it was *'a consistent structure throughout, so then you get used to what the structure is and you know what to expect for the next chapter'* (OTA/PTA). Another participant added it *'flowed pretty well, like, it progressively– this is how you do it, this is the effects of it, then, these errors that could happen'* (OTA/PTA). Another layout feature was the length of the paragraphs. One participant commented, *'the paragraphs weren't that long they were really short, it made it way easier to go through and read'* (MT). Incorporating shorter paragraphs made it *'really easy to follow, short paragraphs I like because I don't like reading long things. I get very distracted'* (MT). Another participant noted, *'it was really easy to go through, so it wasn't too packed with, you know, walls of text'* (OTA/PTA).

Format

The format of a VSOER helped students identify important content. A participant noted the bolding of words *'told me like, oh these are important concepts I should know, so I should take a mental note of them'* (OTA/PTA). Another format strategy was the use of colour. A participant shared when, *'it's just plain text, I don't remember that, but by colouring this sentence helps me to remember'* (OTA/PTA). However, they emphasised *'too much of colour ... throws me off, too. That's why I like this one because it has a little bit of some colours'* (OTA/PTA).

Voice

Participants described that the voice throughout the VSOER was *'more like a conversation than anything else, so, I felt like the textbook was easier to read and go through'* which assisted them to *'grasp the material'* (MT). Another participant agreed and commented *'it's almost like you're just reading as if someone was talking to you'* (OTA/PTA). The conversational voice made it *'really easy to follow and also the explanation of certain terms, it's in simple language'* (MT) even for participants whose first language was not English. Another participant added, *'I liked how the language was building up, so it started from like, easy language' to 'more scientific wording'* (OTA/PTA).

Versions

Most of the participants used both the online and PDF versions of the VSOER. They indicated that the benefits of the online version were convenience, accessibility, and navigation. A participant said, *'just go online from anything – my phone, my laptop – that made it really convenient'* (MT). Another participant commented, *'the navigation in general, it was easier online than it was through like pdf because you could just, like, go directly to that section'* (OTA/PTA). The PDF version also had its own benefits. Participants verbalised, *'if you have the pdf you don't need wifi'* (PN) because *'if you're offline, say you're on the bus and you want to take a read, then you need a pdf'* (OTA/PTA). The PDF version was *'on my computer so that I can access it quickly rather than go to a website'* (OTA/PTA). However, the

concerns with the PDF version were *'blank pages'* (OTA/PTA) and the image quality came out *'blurry'* (OTA/PTA). Participants preferred having both versions and would also like an app because *'in our generation we use a lot of phones and apps'* (PN).

Visual and other types of learning styles

Learning styles were one of the main themes evident in participants' narratives including auditory and kinaesthetic learning and most frequently visual. The codes that were categorised under learning styles included: multi-modal experience; prominence of visual learning styles; learner engagement; memory retention; and class preparation and application.

Multi-modal experience

It was clear that the VSOER's multi-modal experience including visual, auditory and kinaesthetic components was helpful for students. One participant commented that *'it's good' because 'most ... people have different learning styles, the majority of us don't have just one learning style we stick to'* (MT). Another participant noted how *'all the different sensory information'* including *'the audio, the visual, and the reading'* incorporated into the VSOER worked by *'stimulating different parts of ... sensory information'* (OTA/PTA). Another participant's comment highlighted the kinaesthetic learning style activated by the VSOER. To observe videos of vital signs being measured and then, participants could *'do it yourself'* and *'try it again, to try it on yourself or try it on somebody else just to make sure you got the steps down properly'* (PN). Another participant suggested *'having audio as well'* (MT) referring to a desire to have the full text available as an audio version. Another participant added then *'you don't really have to like read through, just listen to it'* especially *'if you're on the train or something ... you just plug in your headphones'* (MT).

Prominence of visual learning styles

Most frequently discussed was the visual learning styles that were activated by the VSOER. Participants noted *'the videos were good'* (PN) because they provided *'a visual of what you should be doing and what you shouldn't be doing'* (PN) and *'I'm a visual learner'* (MT). One participant commented that the visual was helpful because *'you can really see how practitioners practice on the patient, right? So that was really good, like you can actually see how people do it in workplace'* (OTA/PTA). Another participant expanded, *'it's one thing reading about it, you know, ah the clinician is on this side and the patient is here and it's hard – it's hard to visualise'* (OTA/PTA). The visual sensory experience was repeatedly noted by others, *'I liked that there was a link that we could go and see the video ... that helped'* (PN).

Learner engagement

Participants commented on how the visual elements of the VSOER promoted learner engagement and helped them grasp the material. One participant commented, *'I've had online textbooks before but it was just the same as a regular textbook ... [with this VSOER]*

the videos and pictures, like, I'm a visual learner so it's easier to grasp information' (MT). Another participant noted *'the incorporation of the multimedia'* was helpful *'it just keeps you engaged'* (OTA/PTA). Referring to the *'videos'*, the participant elaborated: *'you can't find that in a traditional textbook ... hopefully more textbooks go in that direction because it's really helpful'* (OTA/PTA).

Memory retention

Participants remarked how the visual elements of the VSOER helped in terms of memory retention. One participant remarked, *'if you see something like three different times in a different way it's easier for you to remember'* (MT). Participants commented on how visual association helps with recalling information, stating you *'associate images to your readings, right, so, you – when you have to recall that information you recall the figure or the diagram'* (OTA/PTA). Referring to the videos, one participant said: *'I remember a bit more compared to like straight out reading'* (OTA/PTA). Participants compared the VSOER's visual components with a regular, hard copy textbook, stating it's *'easier to understand the concept from the videos. I feel like you read the text and then seeing a video afterwards kind of just helps you digest the information you just read'* (MT). Another participant echoed this comment, noting: *'It's easier to remember when you see someone performing the vital signs'* (MT).

Class preparation and application

A last code that falls under learning style described the way that participants' narrative reflected how the visual components of the VSOER prepared them for class and for knowledge application. Referring to pulse oximetry, one participant remarked: *'it didn't feel as foreign ... when we got to class today'* because *'I already knew what to expect ... I had seen the visuals of how to do it.'* (OTA/PTA). The participant explained, *'I had that visual association with the actual measurement equipment ... it triggered the memory of the video and then I was like "oh okay" I know what this is, I know what to do with that'* (OTA/PTA). Another participant highlighted how the visual components, specifically the videos, helped in terms of knowledge application. The participant noted, *'you tend to remember what you see, more than kind of what you read'* then *'you get the application of it and you're like "okay now I know how the process works"'* (OTA/PTA).

Discussion

This study has shown positive student feedback when using the VSOER, and these perspectives help build our understanding of how e-textbooks are situated in higher education. When introduced, e-textbooks were the exact replica of the hard copy textbooks (like Kindle) but available on computer. Advancing technology supports novel ways to improve the function and design in teaching and learning activities. Students appreciated the learning activities and interactivity of this VSOER when compared to their previous e-textbooks and asked for more of their books to be created this way. This preference is not always the case; a recent study by Benoit (2018) found that 65.8% preferred hard copy textbooks after using e-textbooks. The design, navigation and

interactivity of the e-textbook used in Benoit's study was not outlined; therefore, it is difficult to compare this study with the current study. This highlights the need to examine outcomes related to e-textbook functions (Gu et al., 2015).

Similar to Cooney's (2017) research, our study found that students easily navigated the digital content in the VSOER. Ease of navigation is important since being comfortable with e-learning is important for healthcare providers' professional growth. When learners engage with technology in their curriculum, there is a heightened acceptance of using e-learning platforms to facilitate lifelong learning (Elf et al., 2015).

It is clear from our study that current students appreciated the ability to access information easily. Our findings also correspond with another study that found students appreciated the convenience of accessing the e-textbook with a number of mobile devices including their phone (Benoit, 2018). It is important for developers to enhance uptake by making e-textbooks available on a number of different platforms. Participants in our study also felt ease of navigation is an important feature. Benoit (2018) explained that when navigation was difficult students stopped using the e-textbook and opted to buy the hard copy textbook. Uptake of e-textbooks is directly affected by ease of navigation. Van Horne et al. (2017) found ease of navigation can be heightened for students when educators share optimal pathways to access information within the e-textbook. Multimedia resources, such as e-textbooks can provide on-demand access to quality resources within the learner's own schedule.

Today's students have access to a wealth of information readily available. Similar to Maloney et al. (2014), our study highlights students' frequent use of YouTube and Google to find social media resources for educational purposes. Our study reinforces that students appreciate OER's multimedia clips and see them as a time saver because they do not have to conduct their own search for specific videos. Our team also notes that our OER gives students unlimited access to demonstrations that were approved in terms of quality and accuracy by their educators. It is suggested that more educators are including specific YouTube clips in their teaching to engage learners (Fleck et al., 2014).

Our study has provided additional insight into the impact of OER on inter-professional experiences whilst there is a need for common resources for inter-professional experiences (Torbjörnsson et al., 2018); there are few studies that examine the inclusion of OER across three different healthcare programmes (Leong et al., 2015). Similar to Leong et al.'s study, our team noted that students from different healthcare programmes are positive about using the OER to learn assessment skills. When healthcare students learn the same skills in the same way it can become a conduit for a common understanding and use of terminology. It also can be used as the basis to provide inter-professional experiences for healthcare providers.

Strengths and limitations

The group approach to data analysis increased the credibility of our findings (J.L. Lapum et al., 2015). Reflexive discussion allowed for a team approach to the coding process. The main limitation of the study was the recruitment of participants from a convenience sample. Although this sampling approach is common in qualitative studies, it has the potential for selection bias (Smith & Noble, 2014). It could be that the participants represented in this study were not a true reflection of the total student population who used the VSOER (Polit & Beck, 2014). In this study, we were only able to explore students'

experience using the VSOER; there is a need for further research related to student learning outcomes, knowledge retention, and application of skills. Experimental studies comparing hard copy textbooks to e-textbooks and specific interactive functions would help to examine learning resources. Another limitation highlighted by the study is that whilst the VSOER is open access cost-effectiveness could be an issue, a cost analysis to assess fiscal effectiveness using this platform is needed.

Conclusion

Our study has identified interprofessional learners' experiences and use of specific features of a VSOER designed to meet their learning needs. Particularly, how a variety of technology-enabled media solidified their knowledge. Importantly, these findings provide design considerations for future authors and designers of all types of e-textbooks. Clearly, there is a need for educators to research and share resources for online learning, thus this study contributes to this end. Like Lapum et al. (2019) we think the burgeoning of technology-enhanced platforms and curricular uptake of OER provides educators with the opportunity to shift education to more adequately meet student needs. The focus group method identified how specific features in OER can meet the learning needs of digitally aware students in three different healthcare programmes. Consequently, effectively designed e-textbooks that are available in an accessible medium can be a common tool for teaching content in interprofessional healthcare programmes. Our findings provide a foundation for OER e-textbook design standards that are student friendly. Future research will enhance our understanding of how specific learning outcomes are related to pedagogical design of e-textbooks.

Acknowledgments

The authors wish to thank Centennial College's Scholarship of Teaching and Learning for funding this study.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Centennial College's Scholarship of Teaching and Learning [Fall 2018].

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