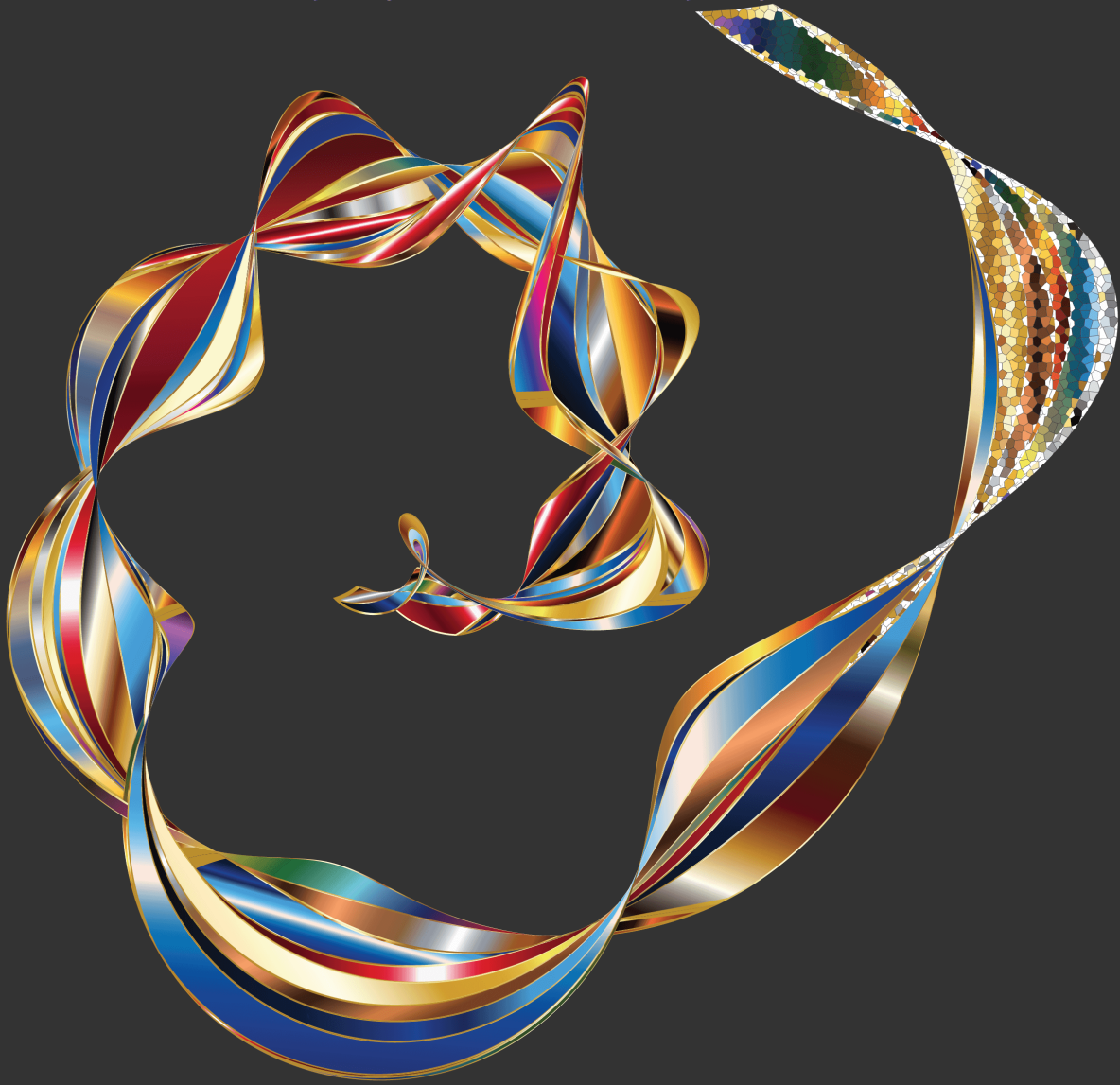


MEM

MEM



An Exploration of E-Textbook Reflections

Steve Swettenham

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An Exploration of Open E-Textbook Reflections

Steve Swettenham

EPUB-FHD.ATHABASCAU.CA
EDMONTON

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To learn more about open textbooks at the Faculty of Health Disciplines at Athabasca University, visit [Faculty of Health Disciplines Open Textbooks](#)

Dedication

This open MEM is dedicated to:

Learners who seek knowledge over prejudice and indoctrination

Mothers and Mentors for our existence and nurturance

Explorers, Experimentalist, and Innovators

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Acknowledgements

The author wishes to acknowledge the achievements of Lawrence Poon and the Learning Technology Team of the Faculty of Health Disciplines, Athabasca University, in development and hosting the first collaborative open source e-publishing system for e-textbooks within a post-secondary environment in Alberta, Canada (WordPress - Pressbooks Content Management System). This EPUB-FHD.athabascau.ca service was open to the world on 2015-08-14.

This simple web publishing service was born from the support and publication initiatives of Dr. Sherri Melrose ([*Creative Clinical Teaching In The Health Professions*](#), and [*Supporting Individuals With Intellectual Disabilities & Mental Illness*](#)), to provide open educational resources for all learners, freely accessible anytime and anywhere via the Internet.

Cover Illustration Attribution

Swettenham / GDJ - Aspartame For All / CC-0 1.0

Foreword

This reflective exploration of experiences in electronic publishing (i.e, e-publishing), using open source software (WordPress and Pressbooks), is for developers, authors, educators, and students interested in contributing to the knowledge base of the world through open electronic literature (i.e., e-literature).

In the past several years the author has been asked how is it possible to get a textbook onto the Internet? This question has led to the establishment of this collaborative e-publishing incubator for open e-textbooks, and further pondering on the present and future opportunities for open e-literature in Canada and the world.

Title Origin

A [MEM](#) is an intersection of media and mind. Humanity has a predilection for recording memories. Digital compilations expand and contract as more reflective memories are committed to bits and bytes. The contributions in this published work within WordPress Pressbooks server are erratic with no regulated frequency - a fluctuating MEM sandwich of content.

A MEM is expressed in content such as “weblogs” ([“Blog,” 2016](#)), containerized for distribution, that can be modified, searched, and annotated. The term MEM describes the next generation digital packaged content of aggregated memories that form a cohesive human readable assemblage for the expressed purpose of assimilating or accommodating meaning into an individual’s reality.

Sensory Device Extension

Mobile devices, from smart eye-glasses to tablets, provide MEM loci of bidirectional connectivity in time and space. The devices are sensory extensions transmitting and receiving reality that may be assimilated, accommodated, or neither permutation of recognition resulting in confusion and noise. Connections may be embedded in the MEM or directly hyperlinked. Depending on the container reader/viewer, the external application may function internally and externally as a connector to the mobile device.

Reference

[Blog](#). (2016, September 19). In Wikipedia, the free encyclopedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=Blog&oldid=740209919>

Disclaimer

This open MEM (i.e., e-textbook, e-literature, etc.) does not represent or express the views of Athabasca University.

This is a personal reflective record rather than a dissertation on the process of creating an open e-textbook via WordPress and Pressbooks. Consider this open e-textbook as a hybrid between a blog and a journal, that is also a test site for Pressbooks configurations. Citation formatting will align with American Psychological Association (APA) standards. In certain cases, footnotes are used for testing text referencing in PDF and ePUB exports.

While the author has been involved with computers since 1979 and the Internet from about 1984, the complexities of technological environs are always humbling. The author has never found a perfect digital system... but it has always been fun trying, in particular integrating Bulletin Board System's into educational environs.

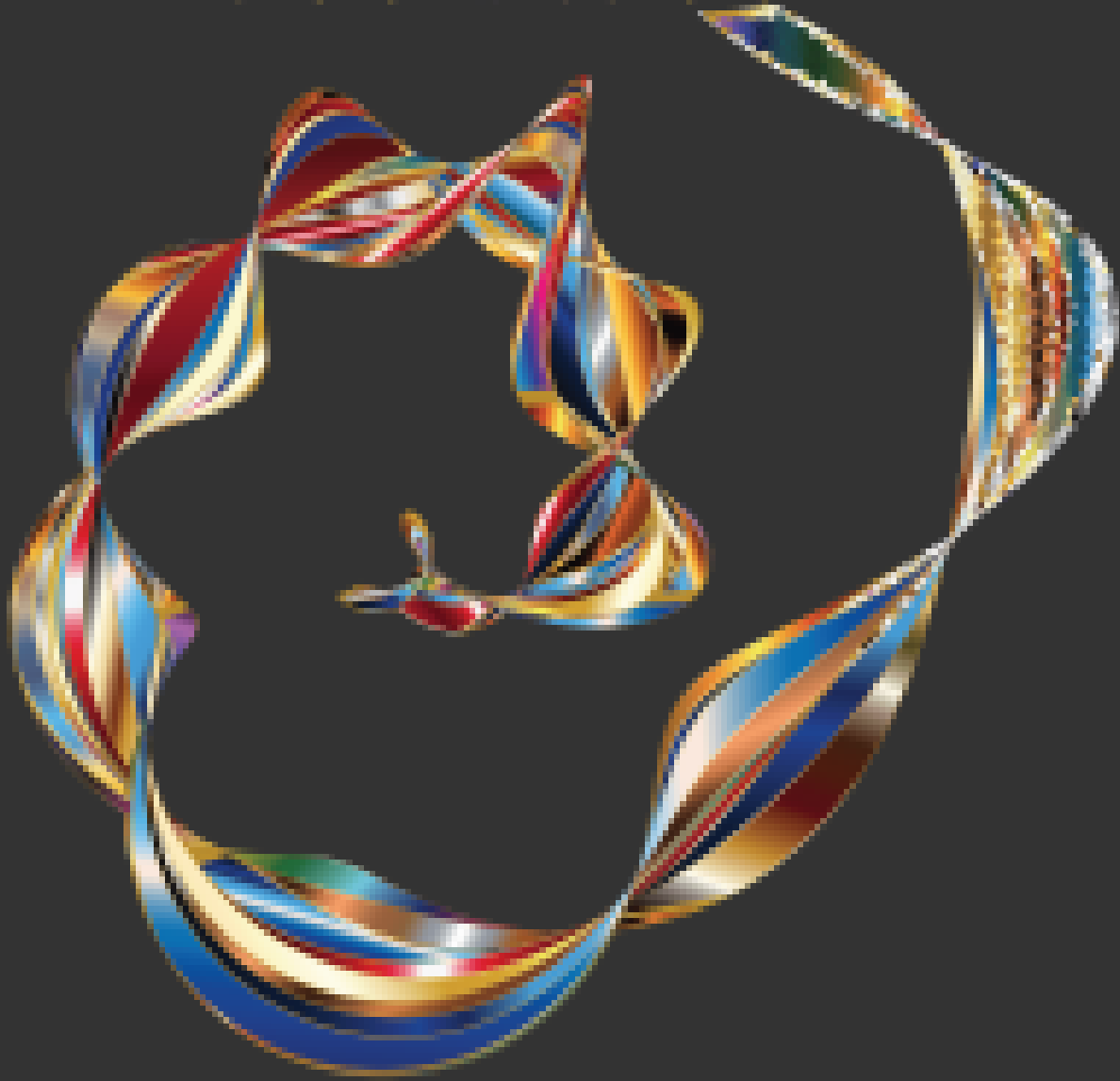
Please note that epub-fhd.athabascau.ca is not affiliated with the Pressbooks.com: Simple Book Production - which is the default footer link. Each new install and upgrade of the open source WordPress multisite with the Pressbooks plugin contains this default commercial advertising.

Releases

2018-08-11 v.6.0

2016-10-19 v.4.0

MEM



An Exploration of E-Textbook Reflections

Steve Swettenham

(MEM 1.0)
2016-09-27 v.2.3

mem
~~e-Textbook~~

Reflections



e-Textbook

Reflections



e-Textbook Reflections



Part I - Pilot Project

Birth of Collaborative Open Source e-Publishing at Athabasca University.

Introduction

In early 2015, Dr. Sherri Melrose proposed the development of an open e-textbook for a course at Athabasca University. The idea of developing the open e-textbook on an open e-textbook publishing system was inspired by previous development of an open e-textbook in 2014 on an open source Pressbooks publishing system at BCCampus. This open e-literature (i.e., MEM) is a personal reflection on developing and deploying a collaborative open source e-publishing system for production and consumption of open e-textbooks at Athabasca University. In addition, this is an alternative method to documenting the pilot project initiative and exploring “practicing what you preach” through creation of this website. The continuous online updating of content (as evidenced by the [revisions page](#)), is a paradigm shift in the form and function of a e-literature that is no longer a passive static product.

Books traditionally defined as a static literary composition ([Apple Inc., 2005](#)), are being disrupted or improved by advances in computing technologies. The computer has afforded an electronic conversion of analog content, perhaps most familiar as hard copy – printed books ([“Book,” 2016](#)). The electronic medium provides a dynamic synchronous and asynchronous transmittance of information over space and time. While the advantages for digital information production and consumption are seemingly limitless, the entire computing system exists by electrons manipulated into the binary number system ([“Binary number,” 2016](#)) and programmatically transposed into a pixel representation that is displayed on a two dimensional surface ([“Pixel,” 2016](#)). Hence, there is an inherent fragility and boundless potential for electronic media.

To exploit the potential of electronic media, necessitates at least three general considerations ([Swettenham, 2006](#)):

Accessibility in the human – technology interface will either promote or reduce utilization. If the book had been a technology that could only be used by a few people under extreme conditions, would it have been perceived differently than it is now? In example, clay tablets that were fragile, heavy, and required much effort to produce.

Transparency of the electronic medium is important in sustaining the transmittance of the information from one age to the next. Regardless of platform or format, if the 0’s and 1’s cannot be easily deciphered by the next wave of technologies, the information may become irretrievable, much like paper that has been damaged by fire, water, or time.

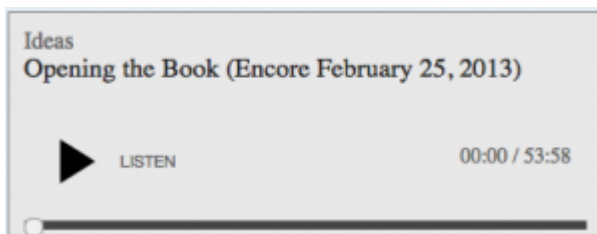
Stability of the digital environment is critical to continued access and sustained transparency of the system. HTML and open source standards are examples of strategies to promote controlled development of digital environs.

The choices in technologies in producing the open source e-textbook - [Creative Clinical Teaching In The Health Professions](#) - employed the aforementioned three considerations. In personal experiences with computing technologies, there is no one perfect choice, only possibilities that are optimal in the context of the project.

Concept of MEM

CBC Ideas

Opening the Book ([Kennedy, 2013](#)) discusses the digital book, connections, future, and human relationship(s) with communication:



(Encore February 25, 2013) Duration 53:58
www.cbc.ca/i/caffeine/syndicate/?mediaId=2338510360

Every human created record, such the parietal wall paintings of Lascaux (["Lascaux," 2018](#)), is a story of human memories, with producers and consumers over time and space; a microcosm of information and encoded knowledge.

What does a scroll and book have in common? Both are analog containers of recorded stories, packaged in a way to be read and transported by humans. It is noteworthy that a replica Lascaux has also been transported beyond its original location (["Lascaux Découvrir la Préhistoire en Dordogne-Périgord," n.d.](#)).

A digital container is a less restrictive form of the analog physical media. Networks transport bits and bytes from one node to another. Within a container, hypermedia content enables a multi-directional approach to information in any digital format imaginable; as exemplified by the Web . What differentiates a website from other Internet of things, is that it is a container of multimedia with attributes to identify the package as a website, rather than a data bits floating in the World Wide Web ether.

Hence, a website can become the digital version of a book, as the application Pressbooks compiles the web pages for export to another container format such as EPUB. A WordPress Pressbooks site by itself is an HTML package that is part of a larger content management system.

Although the current Pressbooks output is restricted by export parameters, it is possible to create a

format converter for the HTML content. In example, there is a Pressbooks export option to transform HTML into LibreOffice document format. The challenge is to map the internal Pressbooks elements (existing format) to the external container elements (new format) as a parallel interchange.

The digital media creates a different environment from the previous traditional hard copy media. Marshall McLuhan predicted the change of the book from individual to crowd users in the following presentation:



Marshall McLuhan - The World is a Global Village ([CBC TV](#)) (YouTube 2009-03-24) Duration 8:44 youtu.be/HeDnPP6ntic

The proposed next generation knowledge and story container is the MEM. The term MEM can be interconnected and interlaced with memories (imagined and/or real). Humanity has focused much energy and resources toward preserving memories, snapshots in time, from cave wall paintings and petroglyphs, to pictographs and digital media. A MEM is an appropriate inheritor of the “book” container; or “memook” for interim transitioning from the analog “book”.

MEM Definition

A MEM is an intersection between media and memory in the form of a digital container representing an aggregated reality and snapshot in time of that reality. Example applications of MEMs are:

- Focused knowledge
- Just-in-time tasks
- Asynchronous communications (dynamic MEMs)
- Synchronous communications (live MEMs)
- Socially constructed (collective MEMs)
- Connected (distributed MEMs)

References

[Apple Inc.](#) (2005). Dictionary (Version 2.2.1 (171.1)) [Apple OS 10.10.5].

[Binary number](#). (2016, March 28). In Wikipedia, the free encyclopedia. Retrieved from https://en.wikipedia.org/w/index.php?title=Binary_number&oldid=712365266

[Book](#). (2016, March 15). In Wikipedia, the free encyclopedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=Book&oldid=710197167>

[CBC TV](#). (2009, March 24). Marshall McLuhan - The World is a Global Village (CBC TV) [Video]. Retrieved October 19, 2016, from <https://www.youtube.com/watch?v=HeDnPP6ntic>

[Kennedy, P.](#) (2013, February 25). Opening the Book [Radio Documentary, 53:58]. Retrieved September 24, 2016, from <http://www.cbc.ca/radio/ideas/opening-the-book-encore-february-25-2013-1.1646075>

[Lascaux](#). (2018). In Wikipedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=Lascaux&oldid=852770648>

[Lascaux Découvrir la Préhistoire en Dordogne-Périgord](#). (n.d.). Retrieved August 11, 2018, from <https://www.lascaux.fr/en>

[Pixel](#). (2016, March 28). In Wikipedia, the free encyclopedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=Pixel&oldid=712295292>

[Swettenham, S.](#) (2006). SOS - In Search of Techno-Sanity ... Retrieved from <http://on-linelearning.ca/agora/deal/sos/>

Hypermedia <https://en.wikipedia.org/wiki/Hypermedia>

Open e-Literature

Contextual Origins

In the exploration of what is open e-literature (e.g. e-textbook), it may be helpful to examine its origin.

A humorous sketch on what and how to use a book that illustrates the human interaction with changing information technologies.



“Øystein og jeg”, Norwegian Broadcasting (NRK) 2001 ([NRK, 2007](#))

News

In the Financial Post newspaper article *Toppling ‘Big Textbook’*, Claire Brownell reported that the financial burdens of textbooks on students to be “more than \$1,000 a year” ([Brownell, 2015, p.FP6](#)). Brownell discussed the online rental services and sellers, as disrupting print textbook publishers. Brownell (2015, p.FP6) noted that “in 2008, print textbooks accounted for 81 per cent of McGraw-Hill Global Education Holdings’ business.” I responded via email to Brownell’s article by *inquiring if she would consider open e-textbook initiatives and free textbook downloads in Canada “a digital disrupter to publishers grip on high prices”?*

... A reply has not been forthcoming.

Follow-up commentary:

The Canadian government subsidizes commercial publishers ([Cyberservices, 2016](#)), but are individual open e-textbook publishers being equally subsidized? Compounding the Canadian

government's commercial support, is an ISO standard for e-textbooks that is favourable to commercial interests ([ISO/IEC JTC 1/SC 36 Information technology for learning, education and training, 2016](#)). Ironically, students and taxpayers could be paying twice for the same product, as exemplified by Merkley ([2016](#)). It is noteworthy that there is currently no open standard for open e-textbooks.

What is a textbook?

According to Wikipedia (["Textbook," 2016](#)), Merriam-Webster (["Definition of TEXTBOOK," n.d.](#)), and other online sites, a textbook is described as an educational resource while deferring to define its physical characteristics. The form of the textbook is worth exploring as it is imbued in digital technologies. Perhaps the paper textbook was an improvement over the clay tablet, as paper could be bent without breaking, easier to duplicate, with conveniently acquired fibers, and was a more durable portable knowledge resource.

The fiber based scroll may have been a welcome improvement over clay, but would have been a different reading experience managing the technology compared to flipping a flat stack of paper sheets. Hence this physical bound stack of paper sheets, has permeated into digital pages, word-processing, portable formats, and returned as hard copy output.

Fiber-based Textbook Characteristics

- mass varies depending on thickness and size of paper, quantity of pages, and binding
- thin sheets of paper bound by a thicker front and back cover
- paper sheets printed by machine for mass production
- assorted sizes (such as letter, legal, A4, A5, etc.)
- organized content
- multimedia content capable

Advantages

- no electricity required
- portable
- tangible (reading and annotation)
- globally entrenched in production and consumption
- better than a clay tablet

Disadvantages

- requires light for reading (caveat Braille or hole encoded; not including wax or vinyl audio)
- damaged by fire, water, age, and separation (i.e., tearing or shredding)
- size and weight

- resource intensive production (paper production, printing, and binding)
- resource intensive deployment (shipping and receiving)
- revision intensive (new editions are time and resource consuming)
- requires some dexterity to manipulate

What is e-literature?

E-literature has often been used as a digital form of the hard copy textbook. In example, many word processing and desktop publishing applications export to a portable document format (PDF), that is a fixed text layout replicating a printed page. Reflowable content formats (i.e., EPUB), are a paradigm shift in accessing multimedia information, as the idea of a “page” is transformed into a screen space that may display endless content in the same space or break the space into separate screens; with a scrolling two-dimensional display of content resembling an actual fiber-based scroll.

Advantages

- hypermedia ([“Hypermedia,” 2016](#))
- synchronous and asynchronous production and deployment
- available instantly world-wide 24-7
- weightless irrespective of quantity of bits and bytes
- searchable
- non-destructive shareable annotation
- online author collaboration
- social network compatible
- interactive (may include games, simulations, etc.)
- multimedia (audio, video)
- multi-layered content
- portable
- accessible on all platforms and computing devices (i.e., smartphones)
- synchronous versioning (non-destructive editing and annotation for authors)
- secure accounting
- copied without cost
- fluid text can be formatted to end user taste with respect to fonts and accessibility

Disadvantages

- hardware and software dependencies (leading to potential failures)
- easier copyright abuse
- electricity required
- easily destroyed (includes encrypted / DRM sources that are non-addressable without special efforts) ([“FairPlay,” 2016](#))
- barrier to people who do not have access to computing devices

The Open in “Open Source”

In general open source may be interpreted as freedom to use in any way you wish ([“Open-source software,” 2016](#)). However, there are more variations in licenses than ice cream flavours, such as Creative Commons collection ([“About The Licenses - Creative Commons,” n.d.](#)) and General Public License ([“GNU General Public License,” 2016](#)). The keyword is open, and this one word means the difference between access for all, and access to those who can afford it. According to the Dictionary ([“Open,” 2014](#)), open is defined as freely accessible without restrictions. Any open e-textbook that restricts the enduser in any way from acquiring the content would not be considered open. Hence, sites that require login access or bury content behind paywalls or commercial content could be considered examples of closed e-textbooks. The source of the content may be free to use and modify, but access to the e-textbook is not open.

Advantages

- free
- content archival proof (not destroyed by Digital Rights Management)
- opportunity for localization
- instant world access
- expanding

Disadvantages

- no direct revenue
- requires resources to create and distribute
- requires human support
- dependent on continued computing support (i.e., hardware and software)

Opportunity

Combine open source ideas with e-literature via the Internet, and now more people than ever before in the history of humanity can instantly access content directly from their smartphones. In 2012 the number of number of smartphones in use reached 1.038 billion units ([Business Wire Inc., 2012](#)).

Dr. Tony Bates on Open Textbooks

Dr. Bates offers an insightful streaming audio discussion on producing an open source textbook.



SFU Teaching and Learning Centre

ETUG 2015 - Tony Bates - Conference presentation

SOUNDCLOUD

Share



ETUG 2015 - Tony Bates - Conference presentation by EdMedia ([ETUG 2015 - Tony Bates - Conference presentation, 2015-06-15](https://soundcloud.com/sfutlc/etug-2015_tony-bates)) https://soundcloud.com/sfutlc/etug-2015_tony-bates

Open Education Resources

Open e-textbooks can be considered open educational resources (OER), as per the definition from the Hewlett Foundation ([“Open Educational Resources - Hewlett Foundation,” n.d.](#)):

OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, **textbooks**, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.

Open Knowledge

The article *“You Pay to Read Research You Fund. That’s Ludicrous”* ([Merkley, 2016](#)) is a commentary on the sources of knowledge and economics:

- <https://www.wired.com/2016/04/stealing-publicly-funded-research-isnt-stealing/>

References

- [About The Licenses - Creative Commons](#). (n.d.). Retrieved April 4, 2016, from <https://creativecommons.org/licenses/>
- [Brownell, C.](#) (2015, September 5). Toppling “Big Textbook” : Digital disrupters are shaking publishers’ grip on high price. *Financial Post*, pp. FP1, FP6.
- [Business Wire Inc.](#) (2012, October 17). Strategy Analytics: Worldwide Smartphone Population Tops 1 Billion in Q3 2012. Retrieved October 25, 2016, from <http://www.businesswire.com/news/home/20121017005479/en/Strategy-Analytics-Worldwide-Smartphone-Population-Tops-1>
- [Cyberservices, G. of C. C. H.](#) (2016, April 22). Canada Book Fund - Overview. Retrieved February 10, 2017, from <http://canada.pch.gc.ca/eng/1449765951331>
- [Definition of TEXTBOOK](#). (n.d.). Retrieved April 4, 2016, from <http://www.merriam-webster.com/dictionary/textbook>
- [ETUG 2015](#) - Tony Bates - Conference presentation. (2015, June 15.). Retrieved from <http://edmedia.tlc.sfu.ca/tag/tony-bates/>
- [FairPlay](#). (2016, March 11). In Wikipedia, the free encyclopedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=FairPlay&oldid=709560305>
- [GNU General Public License](#). (2016, March 23). In Wikipedia, the free encyclopedia. Retrieved from https://en.wikipedia.org/w/index.php?title=GNU_General_Public_License&oldid=711607417
- [Hypermedia](#). (2016, April 4). In Wikipedia, the free encyclopedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=Hypermedia&oldid=713433989>
- [ISO/IEC JTC 1/SC 36 Information technology for learning, education and training](#). (2016, August). ISO/IEC TR 18120:2016 - Information technology — Learning, education, and training — Requirements for e-textbooks in education [Library]. Retrieved March 6, 2017, from <https://www.iso.org/standard/61510.html>
- [Merkley, R.](#) (2016, April 18). You Pay to Read Research You Fund. That’s Ludicrous. Retrieved September 29, 2016, from <https://www.wired.com/2016/04/stealing-publicly-funded-research-isnt-stealing/>
- [NRK](#). (2007). *Medieval helpdesk with English subtitles*. Retrieved from <https://www.youtube.com/watch?v=pQHx-SjgQvQ&feature=youtu.be>
- [Open](#). (2014). Dictionary. Apple Inc.

[Open Educational Resources – Hewlett Foundation](http://www.hewlett.org/programs/education/open-educational-resources). (n.d.). Retrieved April 4, 2016, from <http://www.hewlett.org/programs/education/open-educational-resources>

[Open-source software](https://en.wikipedia.org/w/index.php?title=Open-source_software&oldid=713387677). (2016, April 3). In Wikipedia, the free encyclopedia. Retrieved from https://en.wikipedia.org/w/index.php?title=Open-source_software&oldid=713387677

[Textbook](https://en.wikipedia.org/w/index.php?title=Textbook&oldid=713447865). (2016, April 4). In Wikipedia, the free encyclopedia. Retrieved from <https://en.wikipedia.org/w/index.php?title=Textbook&oldid=713447865>

also retrieved 2015-12-18 from

http://business.financialpost.com/fp-tech-desk/fighting-big-textbook-how-students-are-trying-to-save-money-as-prices-keep-going-up?_lsa=c5e9-b69b

Favourite DRM media experience was a red video DVD-ROM that would disintegrate after 48 hours of light exposure.

Design

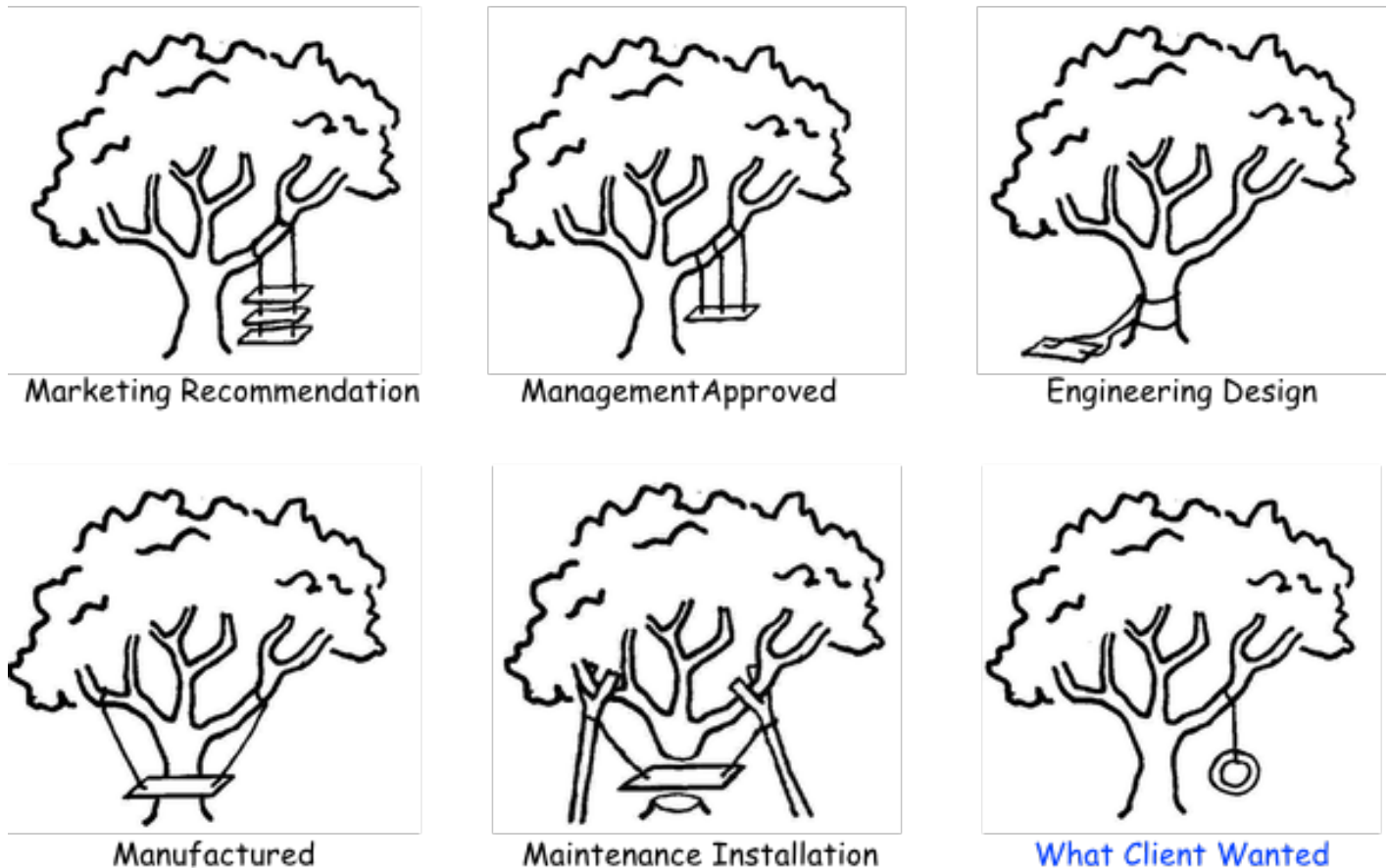


Figure 3.1 - A humorous illustration on the process from design to development and production.

Modified from *Tree Swing Pictures* by Alan Chapman (2016)

This Tree Swing is a visual design anchor, as a reminder to maintain an uncomplicated perspective of the open e-textbook project focused on what the client wanted. Part of this focus involved understanding the project scope, expectations, and necessary compromises.

The project vision for *Creative Clinical Teaching In The Health Professions*, was to provide an online open access Canadian textbook to students and health community, with relevant quality content and current references, accessible from any mobile electronic device. The open e-textbook was intentionally presented in a website context without barriers (i.e., no login), to freely downloadable content in different formats (i.e., PDF, EPUB, MOBI). The technological scope was to install a WordPress Pressbooks system, input the word-processed manuscript, edit content, and output into multiple digital formats for e-book readers and smartphone applications. The open source e-publishing environment

needed to be collaborative with content control (account and versioning).

Holistic Overview

The design of this project flowed in an organic fashion, with continuous reflection, modification, and adaptation. The key project parameters were:

1. The e-textbook had to be accessible on all computing devices, from desktop to smartphone; accessible in the context of ease of acquiring information and viewing it by what ever device the end-user preferred.
2. Project had a very short timeline from initiation of project to deployment (approximately 4 months); promoting information currency.
3. Stakeholders were internal and external to the institution.

Project Challenges

There were many human and technological hurdles along the way, as outlined in the following list:

- Identify all stakeholders, understand their interests in the project, and how best to assist in a positive outcome
- Identify and test e-publishing software applications, and examine existing Internet e-publishing services
- Evaluate risks of adopting leading edge open source software
- Review Canadian online open e-textbook publishing initiatives
- Seek a sustainable online “home” for the open e-textbook

Pathways

[BCcampus OpenEd](#) exemplified the vision of the open e-textbook pilot project, and as a Canadian role model for collaborative open source e-publishing and distribution. Other applications and services were examined for return on investment, however sustainability, autonomy, and availability of open source applications superseded cloud services such as Blurb (<http://www.blurb.com>) and Atavist (<https://atavist.com>). Application and distribution of content via cloud services were reviewed such as ISSU (<https://issuu.com>) and Storify (<https://storify.com>). However, native mobile apps risk maintenance and OS dependency issues, which can become problematic for future sustainability of the project. Although the rental model appears to be the trend (i.e. computer software), with no autonomy or archival quality, this model promotes a culture of short term consumerism and dubious sustainability. An important assumption in consideration of an e-publishing platform was the ability for an open e-textbook site to grow, in content and in adoption. Publishing an open e-textbook is not necessarily the final static product, rather it is the seed of an organic intellect.

Since BCcampus has been successfully using Pressbooks, combined with the project authors’ previous

e-textbook experiences – [Supporting Individuals with Intellectual Disabilities & Mental Illness \(Melrose, Dusome, Simpson, Crocker, & Athens, 2015\)](#), the collaborative academic e-publishing process had already been vetted at the institutional level. It is noteworthy that feasibility of Pressbooks as an e-publishing platform had been tested by Dr. Tony Bates (2015). In addition, Pressbooks has been the focus of an online learning course – [The Amplified Author Mini-Course: Ebook Creation](#).

Alternatives Revisited

There is a wide variety of electronic publishing options from personal computer to cloud services. Traditional desktop publishing provides a high level of autonomy, customization, and proprietary formatting, as the author is dependent on a specific software application that may not be accessible on all hardware. In example, iBooks Author is a free Apple product to produce content for the iBooks reader. Such proprietary formats are not archival friendly or globally accessible. Although [LibreOffice](#) (with EPUB plugin) and [Scribus](#) are open source alternatives, they do not include convenient online distribution and collaboration functionality. LibreOffice open document format is a zip container for a collection of files that is a similar file package to EPUB format. LibreOffice has many features that could produce a comparable output to EPUB, however its original function was office document processing, not hypermedia. The EPUB format is HTML5 hypermedia capable, and thus is a file package that is similar to a reflowable and responsive website in a zip container. This evolution in formatting begs the question of how far can the hypermedia go? Will it supersede the hypermedia functionality found in Apple Hypercard and OWL Guide?

Hence, there are many standalone applications that export to EPUB format with varying degrees of accuracy in output. The Pressbooks application has the advantage of being operating system independent and based on HTML. It is noteworthy that Pressbooks has been forked on GitHub to different purposes such as a multilingual focus or interactive quizzes. Choosing a forked version of Pressbooks would be a concern as it is an additional application layer to the e-publishing system; more layers, more potential issues.

Pressbooks alternatives, such as [Booktype by Sourcefabric](#), can be found on GitHub. Unfortunately Booktype has Python programming language dependencies that may not be available on all Internet hosting services. Booktype features are very similar to Pressbooks in accounts, security, media collection, collaboration, and content.

[OpenStax CNX](#) is another digital publishing system that provides a producer and consumer e-textbook environment. OpenStax CNX software components has complex installation requirements with Zope based Rhapsos software that could limit Internet hosting options.

In conclusion to examining the plethora of e-publishing applications, WordPress Pressbooks was the most flexible option for Internet hosting services, features, and ease of installation.

What the client wanted

The focus of the pilot project was the production and deployment of an open e-textbook, from the source word-processed document and images, that could be accessed by all computing devices from desktop to smartphone. The timeline for this project was less than three months from conception to public deployment. Collaboration was important to enable multiple authors to edit the same content with version control. Hence, an e-publishing system that accurately shared, controlled, compiled, and exported the content to an EPUB reader was the technological baseline.

Authoring Reflections

Dr. Melrose's reflections on the experience of authoring in Pressbooks to produce *Creative Clinical Teaching In The Health Professions* (Melrose, Park, & Perry, 2015):

The result though, is an amazing way of making information available to those who really need it. With the first book Steve and I did, information about mental illness was made available to those who care for individuals with both mental illness and intellectual disability. These caregivers have few other resources to turn to. So, the open access - particularly on Smartphones - was especially important.

Information about clinical teaching was made available to the health professionals who teach in clinical settings. In many instances, these are highly skilled clinicians who work on a sessional or contract basis with educational institutions. They have few benefits and opportunities to learn about how to teach. So, once again, the open access text where they can find teaching tips and theories at a glance, online, on their phones, wherever and whenever they need that piece of information - provides a much needed resource.

Melrose, S. (2015, August 18). e-textbook integration in Alberta.

References

- [Bates, T.](http://www.tonybates.ca/2015/06/10/writing-an-online-open-textbook-is-it-worth-it) (2015, June 10). Writing an online, open textbook: is it worth it? Retrieved from <http://www.tonybates.ca/2015/06/10/writing-an-online-open-textbook-is-it-worth-it>
- [Chapman, A.](http://www.businessballs.com/treeswing.htm) (2016). tree swing pictures - tire swing, tire swing, rope swing cartoon pictures. Retrieved April 4, 2016, from <http://www.businessballs.com/treeswing.htm>
- [Melrose, S.](#) (2015, August 18). e-textbook integration in Alberta.
- [Melrose, S., Park, C. & Perry, B.](https://mem-mem.com/clinical-teaching) (2015). *Creative clinical teaching in the health professions*. Retrieved from <https://mem-mem.com/clinical-teaching>
- [Melrose, S., Dusome, D., Simpson, J., Crocker, C., Athens, E.](#) (2015). Supporting Individuals with Intellectual Disabilities & Mental Illness: What Caregivers Need to Know. Vancouver, British

Columbia, Canada: BCcampus. Retrieved from <http://opentextbc.ca/caregivers>

Alternate Source: Paragon Innovations, Inc. (2005). Outsourcing Guide - Paragon Innovations [Commercial]. Retrieved November 4, 2015, from <http://www.paragoninnovations.com/guide.shtml>

https://help.libreoffice.org/Common/XML_File_Formats

<https://en.wikipedia.org/wiki/EPUB>

<https://github.com/BBGIinnovate/oddibooks>

<https://github.com/lumenlearning>

<https://github.com/sourcefabric/Booktype/>

<http://cnx.org/aboutus/overview>

Development

The [tree swing analogy](#) is an example of how keeping things simple can go awry. Focusing on the design parameters of what the client wanted was essential to a productive and positive process and outcome. However, life happens and compromise was critical to arriving at a product, rather than an unknown future hope.

Employing computing technologies that are flexible and stable in a one content-for-all e-publishing system is a dream. All technologies have their own advantages and limitations. In this pilot project it was necessary to work on the available minimalist system. Hence, the following discussion reviews the configuration specifications employed in the first iteration of the open source e-publishing system.

Building an e-Publishing Platform

A test WordPress Pressbooks server was setup off-site as proof of concept. Due to limited financial, technical, and human resources, the production Pressbooks system was installed in a virtualized configuration. The advantage of a virtualized configuration was ease of backup and re-imaging. In addition, an image is transportable to other computer hardware without the need of reinstall of Pressbooks.

Hardware

- Linux server - Intel Core 2 Duo P9xxx (Penryn Class Core 2), 4G RAM, 100G Disk Space

Software

- CentOS 7 operating system bundled with Apache 2.4.6, PHP 5.4.16 and MariaDB Server 5.5.41 (MySQL fork)
- Virtualization application - Linux KVM
- Multisite WordPress v.4.3.1
- Pressbook System (including Pressbooks Textbook)
- Pressbooks external dependencies:
 - MOBI export for KindleGen - Version 2.9
 - EPUB validation with EpubCheck - Version 3.0.1
 - XML validation with xmllint - Version 2.9.1-5.el7_1.2.x86_64
- WordPress Network Plugins - i.e., Security, Backup, Statistics, Media Handler

WordPress Network Plugins

Table 4.1 *WordPress Plugins Installed for the Pilot Project*

PLUGIN	DESCRIPTION
Enable Media Replace	Enable replacing media files by uploading a new file in the “Edit Media” section of the WordPress Media Library. Version 3.0.3 By Måns Jonasson
Pressbooks	Simple Book Production Version 2.7.2 By BookOven Inc.
Pressbooks Textbook	A plugin that extends Pressbooks for textbook authoring Version 1.2.16 By Brad Payne
Responsive Scrolling Tables	Responsive Scrolling Tables detects when tables are bigger than their containers and makes them scroll instead of flowing over the boundary of the container. Version 1.2.1 By T J Dixon Limited
SVG Support	Allow SVG file uploads using the WordPress Media Library uploader plus direct styling of SVG elements using CSS. Version 2.2.2 By Benbodhi
Thin Out Revisions	A plugin for better revision management. Enables flexible management for you. Version 1.8.3 By Hirokazu Matsui
UpdraftPlus - Backup/Restore	Backup and restore: take backups locally, or backup to Amazon S3, Dropbox, Google Drive, Rackspace, (S)FTP, WebDAV & email, on automatic schedules. Version 2.11.9.20 By UpdraftPlus.Com, DavidAnderson
Wordfence Security	Wordfence Security - Anti-virus, Firewall and High Speed Cache Version 6.0.20 By Wordfence
WP Slimstat	The leading web analytics plugin for WordPress Version 4.1.8.1 By Camu
WP SlimStat - Default Filters	Determine what filters should be loaded by default when your reports are initialized. Version 1.4 By Slimstat
WP SlimStat - Email Reports	Override your sites’ settings with a global configuration Version 2.2 By WP Slimstat
WP SlimStat - Export to Excel	Export your reports as a CSV file. Version 2.5 By WP Slimstat
WP SlimStat - Firewall Fix	Fix the collection of IP addresses when the webserver is behind a proxy, firewall or load balancer. Version 1.6.1 By WP Slimstat
WP SlimStat - Network Settings	Override your sites’ settings with a global configuration Version 1.2.1 By Camu
WP SlimStat - Network View	Access a network view of your reports. Version 1.3.1 By Camu
WP SlimStat - Track Cookies	Collect all the cookies associated with the domain sent by the browser. Version 1.5 By WP Slimstat

These WordPress plugins were selected for quality, stability, and compatibility with Pressbooks. There were a few plugins to enhance the authoring process and presentation of tables, but plugins that worked on a multisite WordPress system were not compatible with the Pressbooks plugin. Each plugin

had to be installed and examined on a test site to confirm that it would not break the site functionality, presentation, or export output. Security was necessary, as any site on the Internet is vulnerable to unscrupulous humans. In general, it is not a question of *if* but rather *when* a site will be attacked. To avoid the tragedy of lost and dearly valued knowledge, multiple backup strategies have been employed including off-site repositories. A staged system failure and full recovery of backup was tested in the process of selecting a viable multisite WordPress backup plugin.

Technology Challenges

- Bug fixes and programming development of Pressbooks ongoing (open source support is a relationship between developer and end-user; both have to collaborate and cooperate to improve and sustain the application)
- WordPress plugins may work in their current version, but an update may not function as expected
- More WordPress plugins mean greater risk of failure due to incompatibilities, security, and software stability
- E-Textbook administrator access issues due to excessive security plugin settings on a WordPress Multisite
- Obtaining a campus sub-domain name and webserver
- Provide a demo sample of a functioning external Pressbooks site as proof of concept (achieved using an instance of Pressbooks on a PHP/MYSQL Internet host)
- Useful WordPress plugins such as shortcodes and table generators will not work in Pressbooks
- Many useful WordPress plugins work for multisite installs but not in Pressbooks
- PDF content layout is different from EPUB format that is free flowing (difficult to cite a page number from fluid layout)
- Third party application may be required, as an EPUB reader is not built into all operating systems (i.e., Microsoft Windows 10)
- Wide tables display poorly in EPUB version
- Presentation of tables in WordPress Pressbooks is simplified compared to output from a word processor or desktop publishing software
- Hidden functions within Pressbooks by design

Wide Tables Phenomenon

Long tables can be very useful in the academic publishing environment, but they are a source of huge frustration when rendering to web pages and export formats. Unfortunately the Pressbooks EPUB format export displays wide tables from HTML pages as cropped text across pages, as per screen capture from iBooks reader:

Table 1. Philosophies of Adult Education

Adapted from Elias & Merriam (1995) and Zinn (1983, 1994, 1998)

	LIB- ERAL	BEHAV- IORIST	PRO- GRES- SIVE	HUMAN
PURPOSE OF EDU- CATION	Develop intellec- tual abil- ities.	Emphasize skill acquisi- tion.	Equip learners with practical knowl- edge and problem- solving skills.	Enhance sonal gro and developr
	Always a learner. Needs to		Learn by doing,	
VIEW OF LEARNER				Seeks practice new experi- menting self-direc knowledge rather than informa- tion.
ROLE OF TEACHER				Experts who transmit knowl- edge. Direct the learning process.
				Strong environmen- tal influence on learning. real-life prob- lems. Orga- nize, guide and establish interac- tive reci- procal relation- ships with learners.
				Motivate responsil Learners have unl- ited pote Facilitate support a partner. Attent to emotio and affec issues.

Figure 4.1 Sample Table Presentation Issue in an EPUB format (original web page version: <https://mem-mem.com/clinical-teaching/chapter/chapter-two-where-do-i-fit-in-articulating-a-personal-philosophy>)

The current work around table solution for the EPUB format is to replace the table with an SVG image . PNG images are convenient as they can be rendered by screen capture, however a PNG does not retain the same meta data and textural content that can be retained by an SVG. A text table converted to SVG retains the text and can be copied or searched by the enduser.

There are two workflows to achieve an SVG in Pressbooks and authoring:

1. Pressbooks SVG
 - a. invoke the SVG Support plugin and modifying the Pressbook Settings > Network Settings > Upload file types > SVG.
 - b. Create a duplicate content of the chapters with long tables and substitute the long HTML tables with the corresponding SVG file from below.
2. Authoring SVG Tables (assuming SVG Support plugin installed) - Install LibreOffice 5.x and create a new Spreadsheet. Select relevant cells, copy then create a new Drawing and Paste Special, and then select calc# from list. Select relevant objects and export to SVG (enable Automatic file name extension and Selection). Add SVG file into Pressbooks.

An HTML book site, that is only exporting to PDF, may not encounter the EPUB table issue. However, to

resolve EPUB export of tables, required duplication of the webpage with substitution of textural tables for SVG tables. In HTML, the Responsive Scrolling Tables plugin provided a clean display of a table, with a horizontal scroll bar below a table (maybe more useful above table). SVG tables in PDF displayed poorly, compared to HTML textural tables. The wide table issue created an unnecessary inconvenience, as one of the primary purposes of employing Pressbooks was a dynamic environment with one central text collection exporting to multiple digital formats.

Experiment

A test modification of CSS wide (300%) versus default (100%) tables, found no effect in HTML or EPUB output, but had a profound effect in PDF export, which displayed in reverse scale to compensate for page size (300% wide tables appear condensed with need to zoom in to see details). Hence, default table CSS in the themes appears to be optimized to display in equal size for all formats.

Future research in floating headers via jQuery may be useful for EPUB output, assuming EPUB format can function with jQuery. In example, `jQuery.floatThread`.

PDF Export Content Layout

The text in the web page editor can include page breaks, however this can have diminishing returns with each update to web pages and subsequent PDF export that may have a different content flow across pages. Hence, using any manual page breaks was avoided, unless it was critical to reading the content correctly. In example, if the conclusion title was automatically broken before the last page, then a forced page break before the title to be included with text body may be more convenient to the reader.

Human Collaboration

Human factors can be the most challenging aspect of any project, as they are far less predictable than computers. When communications between stakeholders occurs less frequently or is confusing, timelines and expectations may risk project delays and inertia. In addition, if there is a loss of interest by a key stakeholder, then alternative options need to be anticipated. Hence, continued project management and engagement of the stakeholders was an important component of maintaining momentum and focus on completing an e-published open source textbook.

Key Actions

- Group email stakeholders (digest content rather than twitter messages)
- Have VOIP (Skype) meeting (preempted with agenda email)
- Bring scope and timelines into alignment
- Remain positive, flexible, and ready for compromise

- Prepare a proof of concept site to move forward and assist in discussions
- Continue researching technology applications as time permits
- Monitor pulse of project to keep the momentum

Maintaining a collaborative group at a distance required constant focused communications. Getting to what the “client(s) wanted” is often more about compromise, as time is a universal constant that supercedes everyone and everything.

Visualize Mobile

Overcoming perceptions and expectations of what is produced from a website onto a smartphone display, versus hard-copy and output from a desktop publishing system, was challenging. The EPUB, MOBI, and HTML formats have dramatically simplified styling and layout to maintain optimal compatibility between export formats. Hence, a PDF generated by Pressbooks will appear more basic and clean compared to a colourful iBook PDF. As noted by Dr. Tony Bates, interactivity is difficult to incorporate into the content. Large tables are particularly challenging to display, as style is controlled by the CSS in the theme template. If the focus is on substance, then Pressbooks functions well in generating the appropriate file formats, however if the form of the content is more important, then limitations will be apparent when tweaking CSS to accommodate expectations. An online mobile 2 dimensional (2D) display of e-texts needs to separate past hard-copy expectations from digital file formats (i.e., EPUB, MOBI) which are much more restrictive in editing, partly due to the HTML editor (TinyMCE), the stage of evolution in the EPUB format, and the range of electronic devices that need to be accommodated.

To aid in visualizing how the e-textbook would appear on mobile devices, several emulator applications were employed for different outputs:

Web

- iPad Peek and Phone Peek
- Screenfly

EPUB and MOBI

- How to Test Your Ebooks
- or How to view an ebook

WordPress

- WordPress v.4.5 had built in previews for different devices that is available in Pressbooks plugin default Pressbooks Publisher theme site customizer (i.e., Appearance > Customize)

Wide content is difficult on small displays such as a smartphone, whereas long text can wrap and flow vertically without losing focus. Thus, small 2D displays are difficult to read with desktop designed

layouts. Transposing content to small screens may require a completely different layout for a swipe and tap interface. The EPUB format defaults to a reflowable text display that is easier to read on mobile devices. Unfortunately, reflowable text does not fit within the APA style of identifying “pages”. However, this paradigm shift in what constitutes a “page” may create a different approach to uniquely identifying and tagging content for citation.

Quirks

Pressbooks

Seemingly by design there are hidden functions in Pressbooks that can be retrieved by button links or using a path statement.

The buttons in the red box outline of Figure 4.2, are a WordPress display of content (rather than Pressbooks layout).

The screenshot shows the WordPress administrator interface for Pressbooks. At the top, there is a navigation bar with the site name 'e-Textbook Reflections' and four buttons: 'Front Matter', 'Chapters', 'Back Matter', and 'Part'. A red box highlights these buttons. Below the navigation bar, the 'Chapters' section is active, showing a table with one row: '9 - Concept of "Book"' by 'steve', published on 2016/02/12. The table has columns for Title, Author, Comments, Date, and a status indicator.

Figure 4.2 Administrator view URL

(http://domainname/sitename/wp-admin/edit.php?post_type=chapter) of WordPress page listing in Pressbooks .

The following examples illustrate URLs that are hidden by default (no option to unhide):

Front Matter

Displays WordPress page listing for Front Matter

http://domainname/sitename/wp-admin/edit.php?post_type=front-matter

Back Matter

Displays WordPress page listing for Back Matter

http://domainname/sitename/wp-admin/edit.php?post_type=back-matter

Trash

When a page is deleted or “moved to trash” it disappears from the organization panel and is held in the trash. The path statement to view the trash listing is:

http://domainname/sitename/wp-admin/edit.php?post_status=trash&post_type=chapter

Favicon

The favicon defaults to a PB image which is complimentary to Pressbooks but perhaps not to a specific site. The global site favicon can be modified in the Pressbooks plugin default Pressbooks Publisher theme site customizer (i.e., Appearance > Customize). However, to modify an individual book site favicon requires a specific path statement to view the customizer options is:

<http://domainname/sitename/wp-admin/customize.php>

The Time Tinkerers Project Summary on October 2, 2013 noted that Pressbooks did not include a back cover for the PDF. A potential solution is to create a web page in the Pressbooks Back Matter with the content for the back cover.

Web Browsers

The Pressbooks release (v.3.1.2) allowed easier linking of HTML anchors within a page. However, creating anchors in Pressbooks was frustrating when trying to link an anchor on one page to another location on a different page. Bilateral linking of citations and bibliographies on the same page was challenging, as id and href are manually created as a mirror image.

Example syntax:

citation

```
<a id="Merkley-1" href="#Merkley-2">2016</a>
```

bibliography

```
<a id="Merkley-2" href="#Merkley-1">Merkley, R</a>
```

In addition, manually entering cross site anchor links must conform to the correct URL syntax, otherwise certain web browsers will fail to read the link correctly.

In example, the following URL with anchor used in one page to link to another page location works in all web browsers except Mac Safari (v.9.0.3):

<https://mem-mem.com/professionalwriting/chapter/how-do-you-effectively-communicate-your-ideas#exercise6>

Safari consequently displays the top of the landing page, rather than the anchor location. What happens is that other web browsers automatically enter a / symbol in front of the # symbol.

Hence, a solution to developing valid links is to use the following syntax:

<https://mem-mem.com/professionalwriting/chapter/how-do-you-effectively-communicate-your-ideas/#exercise6>

<https://www.centos.org/>

http://www.linux-kvm.org/page/Main_Page

<https://wordpress.org/>

<https://wordpress.org/plugins/pressbooks/>

<https://wordpress.org/plugins/pressbooks-textbook/>

https://en.wikipedia.org/wiki/Scalable_Vector_Graphics

<https://en.wikipedia.org/wiki/LibreOffice>

<https://mkoryak.github.io/floatThead/>

[http://guide.pressbooks.com/chapter/section-breaks-page-breaks-and-blank-pages/Writing an online, open textbook: is it worth it?](http://guide.pressbooks.com/chapter/section-breaks-page-breaks-and-blank-pages/Writing-an-online-open-textbook-is-it-worth-it/)

<http://www.tonybates.ca/2015/06/10/writing-an-online-open-textbook-is-it-worth-it/>

<https://en.wikipedia.org/wiki/TinyMCE>

<http://ipadpeek.com/>

<http://quirktools.com/screenfly/>

How to Test Your Ebooks <http://guide.pressbooks.com/chapter/testing-your-ebooks/>

How to view an ebook <https://vook.com/viewing-your-ebook/>

<http://www.idpf.org/epub/301/spec/epub-publications.html#sec-package-metadata-fxl>

Favicon Customize Option <https://github.com/pressbooks/pressbooks/issues/255>

<http://tkbr.ccsp.sfu.ca/mpub/2013/10/02/the-time-tinkerers-project-summary/>

Deployment

Rapid research, design, and development to delivery is part faith, opportunity, and appreciation of a quantum reality.
Anon

The process was organic, with continuous feedback and reflections, on the client needs and compromises. Technologies are continually changing, and the cloud services are a tempting option. In the short term, a commercial e-publishing service may provide an e-textbook product without the administrative and IT challenges in a post-secondary education institution. However, cloud services cannot guarantee long term operation in a capitalist environment.

Textbook Usage

There are three kinds of lies: lies, damned lies and statistics.
- Sir Charles Dilke 1891

Reality depends on what you choose to measure, as paraphrased from Niels Bohr, Copenhagen interpretation

Collecting statistics from Internet activity can be challenging due to the difficulty of filtering out the machine activity, such as a web crawler, from legitimate human users. In addition, the statistical WordPress plugin had bugs that interfered with the quality of the data collection.

A WordPress Slimstat plugin was employed to gather statistics on the activities of the website deploying the multi-format open source e-textbook - [Creative Clinical Teaching In The Health Professions](#). In November of 2015, there were 430 file downloads by unique users. While the quantity of downloads or page access counts cannot determine learning achievements, it is an indicator of level of engagement. Since deployment of Pressbooks on 2015-08-14, the traffic sources have grown from national locations to Australia, Chile, India, Norway, and beyond.

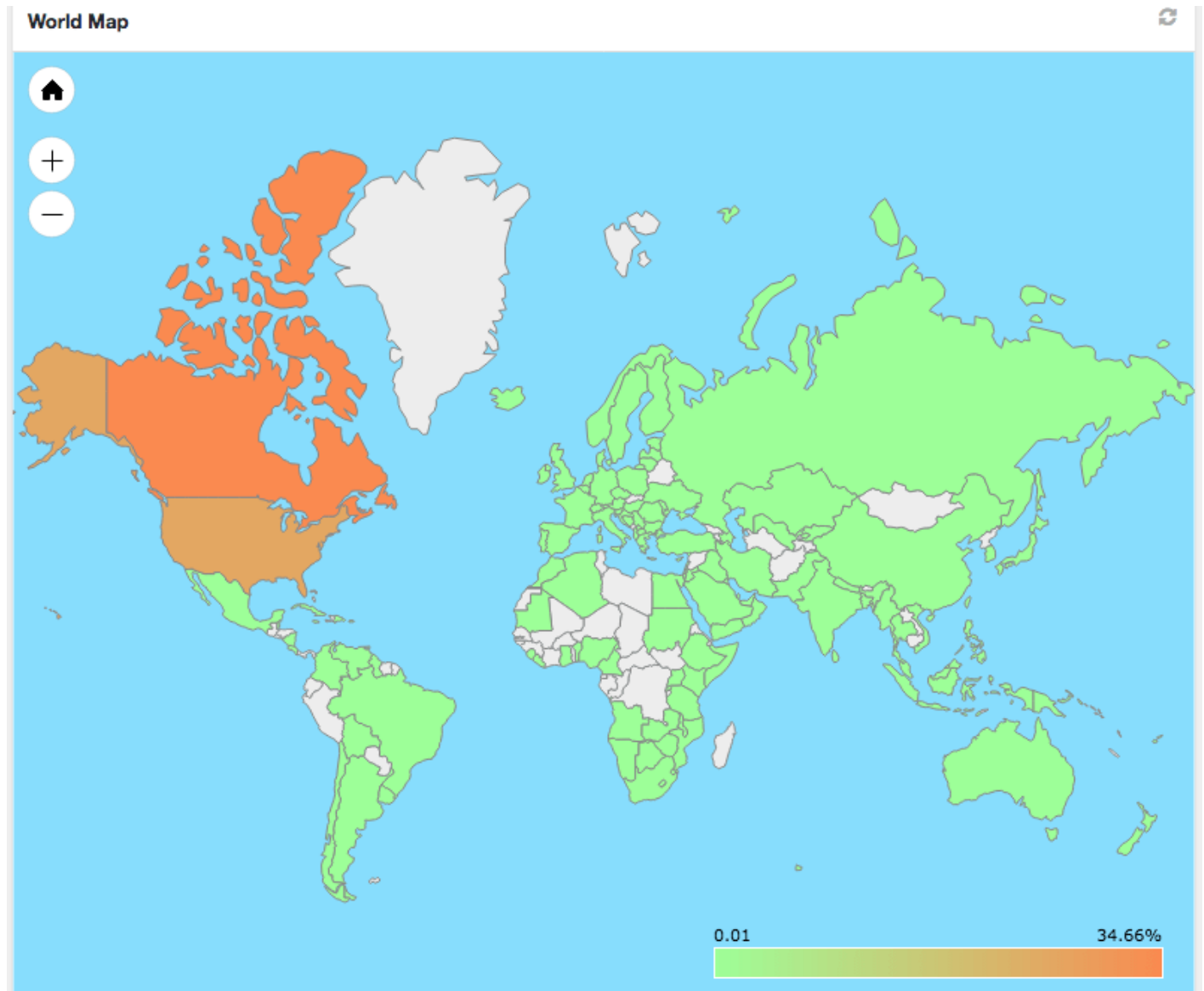


Figure 5.1 WordPress Slimstat plugin geolocation by country for visitors (2017-05-05).

Slimstat shortcodes can be challenging to incorporate in Pressbooks. In particular graphic based shortcodes such as the figure 5.1 geolocation world map can produce a white space on a webpage. However, the current solution for Slimstat shortcode in Pressbooks is to use a Preformatted style, as dynamically produced on this [sites statistics page](#). It is noteworthy that a city geolocation database setting in Slimstat maps a visitor's nearest city location in the form of a black dot (e.g. [sites statistics page](#)).

Recommendations

Backend

- Plugins to consider: SEO ([Yoast SEO](#)), Search Relevancy ([Relevanssi](#) only available for multisite in commercial version), database optimization ([Optimize Database after Deleting Revisions](#)),

comments ([wpDiscuz – Supercharged native comments](#)), audio/visual embedding, quick purge of versions ([Simple Revisions Delete](#) not compatible with Pressbooks), Bibliographic referencing ([Zotero – Zotpress](#)), editor annotation ([TinyMCE Annotate](#) also not compatible with Pressbooks), and multilanguage (i.e., [Google Language Translator](#) currently incompatible with Pressbooks)

- Server caching (i.e., Varnish)
- A computer system with up to date hardware and operating system with PHP 5.6.x and MySQL 5.5.x or greater
- WordPress Pressbooks upgrading required to align with WordPress upgrades, as enhancements can reduce authoring frustrations
- Efficient WordPress multisite installation cloning from development server to production server
- Options in Pressbooks to display the download count for each type of file export format on the site frontpage and in the Export panel.

Frontend

- More exposure within the institution and outside audiences
- Conference and research explorations
- Provincial and federal recognition of achievements and support in open e-textbook publishing in Canada
- More support to programmers of open source applications
- Workshops and training opportunities for authors

Risks

The open source e-publishing is a relationship between producers, consumers, and the institutional environment (including technology systems). Pressbooks developers need to remain committed and flourish in an open source environment. According to WordPress there were only 90+ active Pressbook installations (as of 2015-12-18). In the Pressbooks developer site there are only a few people handling all the issues produced by active administrators and endusers. Hence, the Pressbooks and Pressbooks Textbook applications are supported by a handful of devoted developers. While this can be a strength in achieving goals, with no bureaucratic overhead, the human resources element can not be underestimated. Fortunately Pressbooks, associated plugins, and WordPress platform are open-source, thereby ensuring future open access.

There are many other systems and file formats (both proprietary and open source) that are designed to output e-books. However, they are also subject to similar producer and consumer conditions as Pressbooks. Commercial interests may defer to the old cliché of “you get what you pay for.” In a total cost accounting perspective, an open e-textbook will cost in the production cycle from design to development, deployment, and management. However, the investment of open e-textbooks expands to unlimited consumers. Hence, the open e-textbook product needs to be valued as an important educational resource for everyone, anywhere, at anytime.

Layers of software achieve the presentation that is displayed to the enduser. Due to the nature of the complexity of hardware and software, bugs exists. Future updates in any layer of the software applications from operating system, MySQL, PHP, WordPress, Pressbooks, or plugins, can break the presentation and accessibility to the content. Testing and continued development are critical to the open e-publishing edu-ecosystem.

https://en.wikipedia.org/wiki/Cloud_computing

Lies, Damned Lies and Statistics. (2012, July 19). [Academic]. Retrieved December 18, 2015, from <http://www.york.ac.uk/depts/maths/histstat/lies.htm>

Copenhagen interpretation https://en.wikipedia.org/wiki/Copenhagen_interpretation

<https://www.varnish-cache.org>

<https://wordpress.org/plugins/pressbooks/>

<https://github.com/pressbooks/pressbooks/issues>

e-Textbook Futures

Wordpress Pressbooks application is a hybrid presentation between websites and books, using a blog engine (or content management system) for multiple file format output. Pressbooks is not a completely flexible system, as it has been found to be incompatible with other very useful plugins. Since the application is open source, there is the freedom to modify and improve the code.

Development of Pressbook e-books content is digitally dynamic. Therefore publishing content is less about static fire and forget, and more about nurturing a book site. Each open source e-textbook has the potential to be continuously updated, evolve, and merge into another e-textbook or website. Hence, traditional hard-copy authors may find open e-textbooks more demanding (or frustrating) in a dynamic publishing environment. However, authors who are adept bloggers may be more comfortable in such an environment where:

- Digital books can be more blog like in fluid design and content (i.e., longer webpages, responsive to device display)
- Content changed synchronously (update directly as workflow is from author to content, rather than staged bureaucracy)
- Incorporate interactive multimedia and social networking, including commenting and annotation (add engagement plugins)
- Accessible anywhere, anytime via the Internet or stand-alone WiFi hotspot.

In the author's experiences, public education has been more about a socialist ideal, often dictated by the 'business of education'. Despite the hope of life-long learning for all, education has a monetary cost. The burden of textbook costs combined with tuition is a barrier to financially challenged learners. Open e-textbooks are a digital disrupter in spreading information and knowledge to anyone who has access to a computing device. Ironically, hard-copy may continue to be necessary, as printing of open e-textbooks can be an advantage to learners who do not have access to the Internet or computing devices.

Beyond the consumer barriers, there are the production challenges such as inspiring open source e-publishing versus commercial ventures. Canadian educators and learners need to engage in a paradigm shift enveloping social conscience, financial support mechanisms, community and collaborative initiatives to expand the publishing and adoption of open e-textbooks as important open educational resources, and valued learning experience.

Future research on open e-textbooks may include:

- adoption rates

- OER philosophies and politics for stakeholders
- open e-textbook policy
- authoring perceptions
- learner perceptions
- repositories initiatives
- portable Pressbook e-publishing system
- comparison of learning from hardcopy versus electronic copy
- technology considerations to support e-publishing
- developing stewardship and value in OER's and open e-textbooks
- open and transparent total cost accounting of open source e-publishing to promote student cost savings in textbook purchases

While iBooks format and commercial services offer proprietary solutions to readers, open source solutions liberate the producers and consumers from being locked into specific hardware or software. Alternative open source application such as Drupal Thunder and Docuwiki offer a different development and production experience, but with the same consumer PDF and EPUB outputs. Therefore, WordPress Pressbooks is one of many open source applications able to promote sharing, equality, and freedom of knowledge.

Feature Request for Comment Plugin compatibility

<https://github.com/pressbooks/pressbooks/issues/331>

<https://www.drupal.org/project/thunder>

<https://www.dokuwiki.org>

Part II - Project Upgrade

Rebirth via a major server upgrade.

Evolution

Introduction

In the life of a computing system, the administrator and stakeholders can choose not to change the existing system, or move forward to the latest upgrades. On January 13, 2016 after more than two months of research and testing, the administrators chose to move Pressbooks from CentOS 7 to a Ubuntu OS 15.10 with approximately 60 seconds of interruption in services. Upgrading included WordPress 4.4.1, WordPress plugins, Pressbooks, Pressbooks Textbook, PHP, and MYSQL applications.

Plugins

Table 7.1 WordPress Pressbooks Enabled Network Plugins

PLUGIN	DESCRIPTION
Enable Media Replace	Enable replacing media files by uploading a new file in the “Edit Media” section of the WordPress Media Library. Version 3.0.4 By Måns Jonasson
jQuery Smooth Scroll	The plugin not only add smooth scroll to top feature/link in the lower-right corner of long pages while scrolling but also makes all jump links to scroll smoothly. Version 1.4.0 By BlogSynthesis
Pressbooks	Simple Book Production Version 3.5.2 By BookOven Inc.
Pressbooks mPDF	Open source PDF generation for Pressbooks via the mPDF library. Version 1.0.1 By Brad Payne
Pressbooks Textbook	A plugin that extends Pressbooks for textbook authoring Version 2.2.2 By Brad Payne
Simple Comment Editing	Simple comment editing for your users. Version 1.9.1 By Ronald Huereca
SVG Support	Allow SVG file uploads using the WordPress Media Library uploader plus direct styling of SVG elements using CSS. Version 2.2.2 By Benbodhi
Thin Out Revisions	A plugin for better revision management. Enables flexible management for you. Version 1.8.3 By Hirokazu Matsui
UpdraftPlus - Backup/Restore	Backup and restore: take backups locally, or backup to Amazon S3, Dropbox, Google Drive, Rackspace, (S)FTP, WebDAV & email, on automatic schedules. Version 2.11.29.22 By UpdraftPlus.com, David Anderson
Wordfence Security	Wordfence Security - Anti-virus, Firewall and High Speed Cache Version 6.0.24 By Wordfence
WP First Letter Avatar	Set custom avatars for users with no Gravatar. The avatar will be the first (or any other) letter of the user’s name on a colorful background. Version 2.2.3 By Dev49.net
WP Slimstat Analytics	The leading web analytics plugin for WordPress Version 4.3 By Camu
WP SlimStat - Default Filters	Determine what filters should be loaded by default when your reports are initialized. Version 1.4 By Slimstat
WP SlimStat - Email Reports	Override your sites’ settings with a global configuration Version 2.2 By WP Slimstat
WP SlimStat - Export to Excel	Export your reports as a CSV file. Version 2.5.2 By WP Slimstat
WP SlimStat - Firewall Fix	Fix the collection of IP addresses when the webserver is behind a proxy, firewall or load balancer. Version 1.6.1 By WP Slimstat
WP SlimStat - Network Settings	Override your sites’ settings with a global configuration Version 1.2.1 By Camu
WP SlimStat - Network Analysis	Access a network view of your reports. Version 1.4 By Camu

WP SlimStat - Track Cookies

Collect all the cookies associated with the domain sent by the browser.
Version 1.5 | By WP Slimstat

The new WordPress plugins were: Plugin Activation Status, Pressbooks mPDF, Simple Comment Editing, and WP First Letter Avatar. The Responsive Scrolling Tables and Plugin Activation Status plugins were uninstalled, as both were redundant with latest WordPress and Pressbook upgrade. The Simple Comment Editing plugin was added to enhance the commenting option. The epub-fhd.athabascau.ca site is primarily for authoring and distribution of mobile file formats, with support from web page versions. Hence, commenting supports the content, rather than an extension to further discussions appropriate to blogs or forum based systems. Comment spam can become a concern that can be partially mitigated with an anti-spam plugin that is compatible with the native WordPress commenting system. In general, more plugins increase the potential security risk, hence less is better for the overall health of the e-publishing system. The value of each plugin has to be considered in comparison to its value for the end-users. Another factor, is the WordPress core that continues to improve and may include functionality that previously existed as a plugin. Care in selection of appropriate plugins to the Pressbook site is a challenge in a constantly changing digital environment. In example, an aggregate multisite RSS feed plugin may be useful in pushing the latest page changes to end-users from the main site. However, WordPress already has built-in RSS feed functionality for each sub-site.

Pressbooks has dropped mPDF from its core plugin. Fortunately, BC Campus programmer Brad Payne has created a Pressbooks mPDF plugin to restore open source mPDF generation. Currently the Pressbooks symbionts folder includes a prince folder that suggest Pressbooks will continue to include commercialware support for PDF generation in its core plugin.

Same Domain Different Server

The workflow to achieve minimal interruption in services between the old production server on CentOS and the new server on Ubuntu was achieved through the following process based on key preparations.

Preparations

- Old WordPress multisite updated to latest version.
- Database checked for data integrity
- Files scanned for malware and data integrity
- Configured two domains - production and development
- Virtualization application - Linux KVM

Workflow

A. Development Domain - Create a fresh install of the latest WordPress on new server.

1. Setup the WordPress multisite configuration.
2. Copy the Database from production domain server to new server.
3. Copy the wp-content folder from production domain server to new server.
4. Modify htaccess and wp-config files to conform to development domain URL.
5. Change all URL's from epub-fhd to dev-fhd via PHP script - Search Replace DB version 3.1.0
6. Check that site is working correctly and upgrade WordPress plugins.
7. Check that site is working correctly.
8. Switch domain name from development to production via local host file.
9. Return to step 4 and repeat
10. Return to step 5 and do the opposite operation - change all URL's from dev-fhd to epub-fhd.

B. Production Domain

1. Switch IP from old server to new server.
2. Check that site is working correctly.

The resulting upgraded production server ran the latest WordPress multisite Pressbooks, on an Apache server in a Ubuntu OS. The entire system had been virtualized on CentOS 7. Figure 7.1 is an overview of the layers to achieve the Athabasca University open source e-textbook website.

Athabasca University
Open Source e-Textbooks

Pressbooks
Pressbooks Textbook
Pressbooks mPDF

Themes

Plugins

Media

WordPress Multisite 4.4.1

APACHE
Server

MYSQL
Server

PHP
Server

Ubuntu 15.10
(virtualized)

CentOS 7

Figure 7.1 Pressbooks e-Publishing Application Ecosystem

Virtualization

The advantages of virtualizing a server are:

- Copy to backup routine is efficient
- Virtualized package is portable
- Isolation from hardware
- Open source
- Easy porting to other computer systems

Some disadvantages of a virtualized platform are:

- Requires faster CPU and memory
- Virtual application required
- Specific virtual file format
- Requires host operating system

Brad Payne - <http://bradpayne.ca/>

mPDF - <http://www.mpdf.com/mpdf/index.php>

http://www.linux-kvm.org/page/Main_Page

Database Search and Replace Script in PHP

<https://interconnectit.com/products/search-and-replace-for-wordpress-databases/>

Connections

Net Awareness

Having a Pressbooks based site to distribute open e-textbooks is a great start in an expanding OER world. However, in the universe of the Internet of things, key sites can be lost in the virtual hinterland. How can an open source e-textbooks site gain proliferation across the Internet?

One strategy is to augment web page metadata to enhance search engine optimization (SEO) for Google. This strategy is problematic when ever site is doing the same SEO, which results in a non-stop juggling to be on the top pages. It could be challenging to retrieve an open e-textbook solely on subject search, if there are many identical metadata. Alternatively, cost based marketing may elevate exposure or social network recommendations.

Another strategy could be to leverage the technology within Pressbooks Textbooks plugin that uses a Remix feature to aggregate online Creative Commons Pressbooks publications into a global catalog.

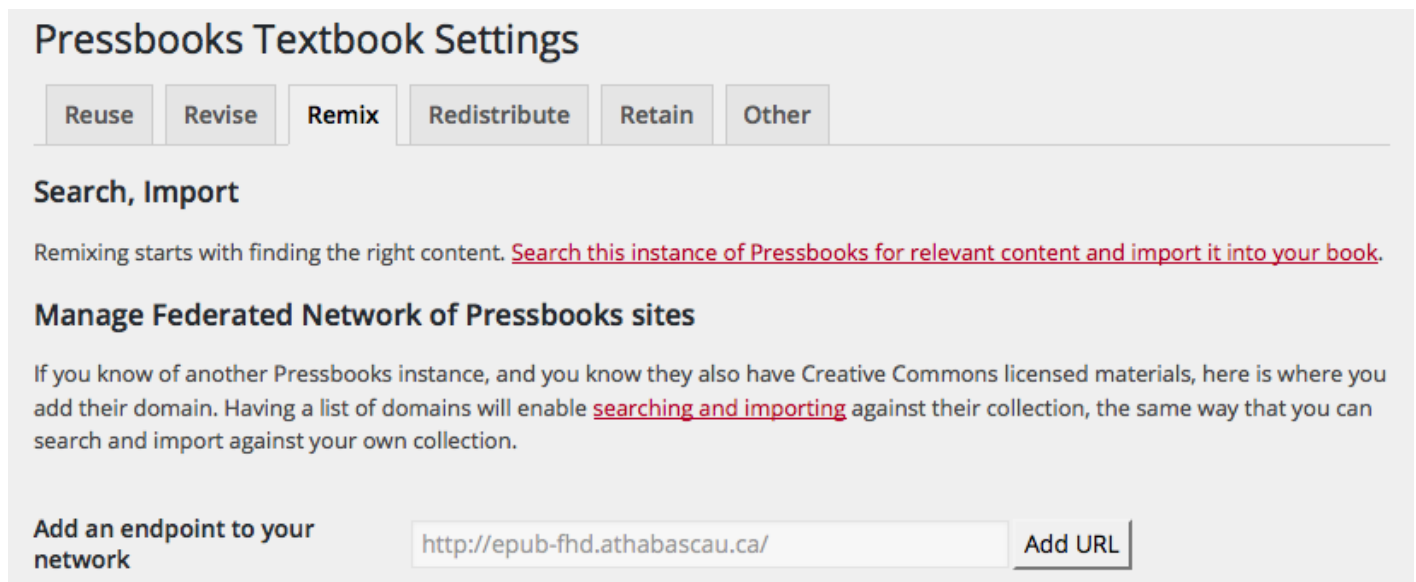


Figure 8.1 Pressbooks Textbook Plugin Remix Interface (Payne, n.d.)

However, the purpose of Remix is to pull and reuse content, rather than function as a global library. It would be interesting to have a plugin that creates a global catalog of all Creative Commons Pressbooks instances. A global catalog of open e-textbooks may offer localized hotspot WiFi libraries hosted in non-Internet zones, such as a train station, subway, and bus stops.

Content Updates

Currently the Remix function of the Pressbooks Textbooks plugin is the closest option for administrators to access the latest content from the epicenter of the original Pressbooks site. However content that changes at the epicenter is not relational with cloned sites, such that updates of chapters and epub files on the source site do not automatically update cloned sites. In addition, there is no notification of updated content in the same way that administrators obtain WordPress plugins update notifications.

Connections

A connectivity similar to the remix in Pressbooks Textbooks plugin could provide a manual/auto-update notification function for end-users. In example, a change in open e-textbook edition could initiate a notification in the global library of changed content. A side-effect of such a notification is that it would be more advantageous to change content to promote net awareness of an open e-textbook.

References

Payne, B. (n.d.). Pressbooks Textbook. Retrieved May 10, 2017, from <https://wordpress.org/plugins/pressbooks-textbook/>

Part III - Untethered and Mobile

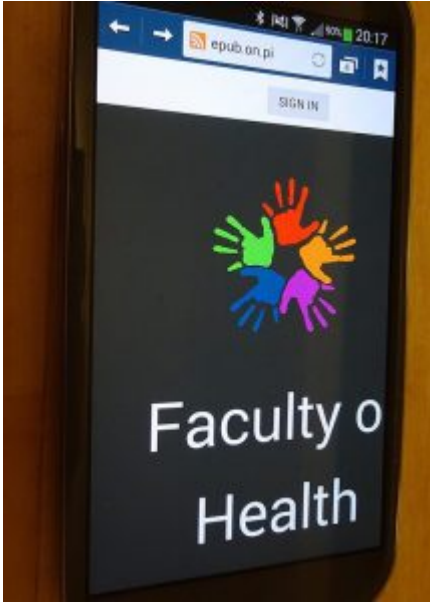
The virtualized book bus.

MEM Box

The MEM box system (computer + stand-alone router), a portable autonomous WordPress Pressbooks server, was a proof of concept. The following information is a record of the experience and method based on the work by Lawrence Poon and Steve Swettenham.



Raspberry Pi 3 Model B hardwired to WiFi Router with desktop display of resulting Pressbooks server book site.



Smartphone display of Pressbooks server from WiFi Router with attached Raspberry PI3.

Why Autonomous?

There is no need to presume that everything must be connected to the Internet to function with computing devices. There are many areas of the world and contexts where a stand-alone Wireless Local Area Network could work with existing smartphones, independent from the Internet. In the 1980's and 1990's, Bulletin Boards Systems operated as autonomous digital communications centers for computers connected via modems. The main differences with modern systems is hardware and software that takes advantage of wireless communications. Hence, the end-user modem has now become a built in wireless hardware for smartphones, tablets, or larger computers.

The Raspberry PI3 Model B (PI3) with a Linux operating system provided the opportunity for an ultra low cost and compact Pressbooks server to be deployed as an autonomous system anywhere in the world.

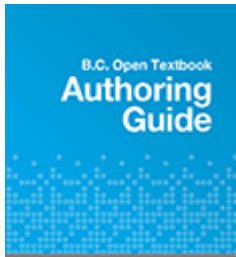
Method

The process required experience with installing hardware, operating systems, software, and configuring a specialized router capable of stand-alone WiFi.

A brief overview of the process involves installing Ubuntu on the PI3 with PHP and MySQL, then installing WordPress Multisite. Afterwards, a backup of the original site was restored to the new WordPress Multisite. The router was configured as a stand-alone operation (i.e., disconnected from the Internet), and the IP of the PI3 was changed to work with the router settings. Testing of the router wire and wireless connections confirmed correct operation.

External Resources

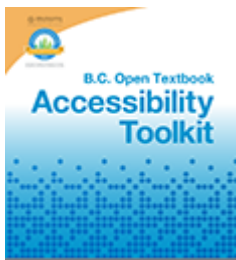
Authoring



BC Open Textbook
Authoring Guide
By Lauri Aesoph
and Amanda
Coolidge CC-BY 4.0

<https://opentextbc.ca/opentextbook> (Aesoph & Coolidge, 2014)

This is an introduction to creating content in Pressbooks; as of 2017-02, parts of the text did not yet include details on embedding a video or audio for export into PDF and EPUB.



BC Open Textbook
Accessibility
Toolkit By Amanda
Coolidge, Sue
Doner, and Tara
Robertson CC-BY
4.0

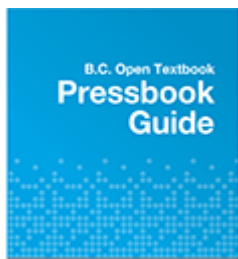
<https://opentextbc.ca/accessibilitytoolkit> (Coolidge, Doner, & Robertson, 2015)

This is an expanded version of a chapter on accessibility from the previous text - BC Open Textbook Authoring Guide. This etext is available in a French version.

[PB - Pressbooks Help Center](#)

This Pressbooks commercial support site (“Pressbooks Help Center,” n.d.), is a generic aggregate of information for commercial and open e-texts. However, information on themes could be confusing as some themes are only available on the Pressbooks commercial site.

General

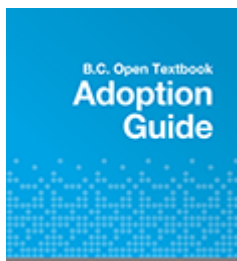


B.C. Open Textbook
Pressbooks Guide
By Lauri Aesoph
CC-BY 4.0

<https://opentextbc.ca/pressbooks> (Aesoph, 2016b)

An overview of Pressbooks that overlaps information in the Authoring Guide.

Advocacy and Adoption



BC Open Textbook
Adoption Guide By
Lauri Aesoph
CC-BY 4.0

<https://opentextbc.ca/adoptopentextbook> (Aesoph, 2016a)



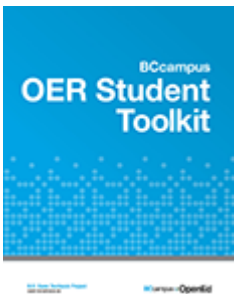
Faculty OER Toolkit
By Shannon Moist
CC-BY 4.0

<https://pressbooks.bccampus.ca/facultyoertoolkit> (Moist, 2017)



BC Open
Education Tools
CC-BY 4.0

<https://open.bccampus.ca/bcoer-librarians/bcoer-tools> ("BC Open Education Tools | BCcampus OpenEd Resources," 2014)



BCcampus OER
Student Toolkit By
Daniel Munro,
Jenna Omassi, and
Brady Yano CC-BY
4.0

<https://opentextbc.ca/studenttoolkit> (Munro, Omassi, & Yano, 2016)

[The Pressbooks Network Manager's Guide](#)

Background

Open Textbooks 101 - <https://open.bccampus.ca/open-textbook-101> ("Open Textbooks | BCcampus OpenEd Resources," 2012), is a basic overview in relation to OER's and licensing.

References

Aesoph, L. (2016a). *BC Open Textbook Adoption Guide*. BCcampus. Retrieved from <https://opentextbc.ca/adoptopentextbook>

Aesoph, L. (2016b). *BC Open Textbook Pressbooks Guide*. BCcampus. Retrieved from <https://opentextbc.ca/pressbooks>

Aesoph, L., & Coolidge, A. (2014). *BC Open Textbook Authoring Guide*. BCcampus. Retrieved from <https://opentextbc.ca/opentextbook>

BC Open Education Tools | BCcampus OpenEd Resources. (2014, July 21). Retrieved May 10, 2017, from <https://open.bccampus.ca/bcoer-librarians/bcoer-tools/>, <https://open.bccampus.ca/bcoer-librarians/bcoer-tools/>

Coolidge, A., Doner, S., & Robertson, T. (2015). *BC Open Textbook Accessibility Toolkit*. Retrieved from <https://opentextbc.ca/accessibilitytoolkit>

Moist, S. (2017). *Faculty OER Toolkit*. BCcampus. Retrieved from <https://pressbooks.bccampus.ca/facultyoertoolkit>

Munro, D., Omassi, J., & Yano, B. (2016). *BCcampus OER Student Toolkit*. BCcampus. Retrieved from <https://opentextbc.ca/studenttoolkit>

Open Textbooks | BCcampus OpenEd Resources. (2012, December 9). Retrieved May 10, 2017, from <https://open.bccampus.ca/open-textbook-101/>, <https://open.bccampus.ca/open-textbook-101>

Pressbooks Help Center. (n.d.). [Knowledge base]. Retrieved May 10, 2017, from https://pressbooks.groovehq.com/help_center

Site Statistics

The WordPress Slimstat plugin is used to log statistics for this website:

Audience

Page Views

Back Cover

Clipart courtesy of openclipart.org

Bibliography software by Zotero www.zotero.org

The Blurb (ode to Marshall McLuhan):

Authors can rapidly e-publish with Pressbooks in a basic template.

