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Better Learning with the Use of E-tools

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The objectives of this symposium are:

- Review the development of e-learning technology in Hong Kong; as well as related policies and supported services for print disabled students;
- Discuss the barriers and opportunities of e-learning technology for print disabled students;
- Explore the future trends of e-learning technology;
- Share overseas successful experiences and latest IT development in e-learning.

I would like to focus on the last three of these themes, and of course talk about the coming trend of the e-book, particularly with respect to learning. I will talk about the technical formats, particularly that of EPUB, but just as importantly, the issue of accessible devices upon which to read accessible content. It is important that we don't focus all our efforts on just the technical platform or format, and forget to ensure that learners with a print disability can actually independently access such content on devices they can use.

I also want to say a few words about another aspect of learning, and that is assessment of learning, and the need to ensure that the coming and in some-cases already arrived move to online assessments is an accessible one for print disabled learners.

Lastly, I will make a few remarks about a fast-emerging technology, which I suspect is going to have a major impact on all of us, including learners over the next few years: that of artificial intelligence and specifically, platforms such as Amazon's Alexa, Google's Home products and similar devices from the likes of Apple. Make no mistake: these devices are a lot more than just smart speakers, which can play your favourite music; they are already showing signs of how they might be used in the learning environment.

Let's turn first though to the e-book, and its role in the learning process.
E-book technology means that a print disabled student can receive their learning material at the same time as their non-disabled counterparts, and in full, thereby allowing them to learn at their own pace and to do background reading.

If we get this right, we will at long last have solved the problem of students not receiving accessible books with which to undertake their studies, often until its way too late. Or, receiving accessible books on time but only part of the book: the parts somebody else judged to be the most urgent.

I would argue that the reading needs of students are often more demanding than those of recreational readers. By that, I don't mean that recreational readers want to read less, or that their

reading isn't as important. What I mean is that the student needs more information about what they are reading: they need to be able to move through a book in a non-linear way so they can focus on a particular chapter, section or even footnote.

The eBook must allow quick and accurate navigation; otherwise, the student is slowed down and frustrated by the limitations of their electronic book. Many have commented that, for instance, a Kindle book, while often being perfectly readable in terms of the text, is hard to use if youneed to locate a specific passage. The book must also be fully accessible – in other words, all aspects of the eBook, including the multimedia features, must be accessible to the print disabled student, not just the text component.

I will talk today about accessing content from mainstream publishers, but I do also want to give a plug to Bookshare.
Many of you will know about Bookshare already, and those who don't are missing out.

It is a superb online library for people with print disabilities, from which eBooks can be downloaded in either braille or DAISY format.
Many publishers supply content directly to Bookshare. Categories range right across the different subject headings, from fiction, via science, technology, history and even engineering. Bookshare is a US-based library, but international membership is available. In Hong Kong, when I last checked, 394,000 titles were available to download for people who meet the criteria for membership. While Bookshare won't meet every need your students have, it will certainly be a great source of materials and every student, in my view, should be a member.

Bookshare is part of the benetech group – a not-for-profit organisation dedicated to making information accessible. They have a particular interest in making learning materials accessible, which is one reason I mention them today. Benetech is also working hard, through the Diagram Center, on making visual information accessible, such as images and diagrams. They recognise that primarily visual information cannot be ignored; it must be described in ways which make sense to a print disabled learner. Many of the recent advances in the mainstream publishing world are happening because of the expertise of organisations like Benetech: so, even when they are not providing content, they are enabling many others to do it.

Benetech is one of the driving forces behind the concept of books being "born accessible". Born Accessible is something the print disability sector can champion, but it relies on mainstream publishers to actually bring it about.
Born Accessible cuts out the middleman: the specialist transcription organisations, so that publishers provide accessible content to their readers directly. This doesn't mean there's no need for those transcription organisations; on the contrary: it frees them up to focus on complex transcriptions which still require specialist expertise, such as the production of STEM materials which don't easily lend themselves to automation, or which require human intervention to make judgement calls.

For twenty years, blindness organisations in particular pioneered a digital solution called DAISY: digital accessible information system.

Over the past two decades, the daisy consortium has developed, maintained and enhanced an audio and e-book standard which has been adopted by many blindness agencies and their libraries around the world. It has provided the reader with navigation capability similar to that which sighted book readers have always enjoyed. So, when reading a DAISY formatted book, I can move around typically between chapters, sub-sections, pages, parts etc. If included, I can even read annotations, footnotes etc. For many years we have argued that DAISY was the best way to publish, and the best way to read, whether with fingers, ears, or eyes: that is braille, audio book or large print.

But DAISY has been regarded by some as a blindness product: not intentionally so, but effectively so nonetheless.

This is changing with EPUB3. I probably don't need to tell any of you about EPUB: this e-book standard is widely used by mainstream publishers. What we love about EPUB3 is that, if followed and implemented correctly, accessibility advantages of DAISY are baked right into it. This has happened thanks to close collaboration between the DAISY Consortium and the IDPF, the international body which maintains the EPUB standard, and an organisation which was recently absorbed into the World-Wide Web Consortium (W3C), which oversees the development of web-based standards.

If an accessible EPUB3 book is produced, these are just some of the characteristics it might have:

- Easy navigation around the publication: having access to the content is great, but it is much better if one can navigate it efficiently and get to the part of the book needed;
- Integrated human narration or text-to-speech
- Verbalised descriptions of pictoral and other graphical information;
- Implemented Standardised accessibility guidelines: ensuring that the EPUB3 book is indeed accessible after all;
- If Digital Rights Management techniques are used, they don't interfere with the assistive technology used to access the publication. If they do, this would also render an otherwise accessible publication inaccessible once more;
- The ability for the book to be read by a variety of devices and technologies used by print disabled people. An accessible publication which is tied to an inaccessible book reader again renders that publication inaccessible, regardless of how accessible the content is itself.

All of this is of particular benefit to learners.

So we can see the real potential over the coming years for a mainstream e-book multimedia format to have accessibility build into it right from the point of creation: in other words, the prospect of commercial electronic and audio books to be born

accessible. As a result of this progress, more and more international publishing bodies are identifying EPUB and, specifically, EPUB3 as their eventual preferred publishing format.

Nobody wants to minimise the complexity of the task ahead of us if we're to make Born Accessible a reality rather than a dream. EPUB3 may indeed be an accessible mainstream standard, but it is perfectly possible to make it inaccessible, if you don't follow good practice, just as it is possible to make inaccessible HTML or Microsoft Word files even though if done properly they are exceedingly accessible formats.

You don't adopt EPUB3 just like that. And there is the issue of getting from earlier versions of EPUB to the accessible form of it, even if you're already an EPUB producer. But the prize is in sight, and it is closer than it has ever been before.

While I'm here though, I want to briefly return to that issue of the accessible eBook reader. If EPUB3 and other formats are to be truly accessible, it is not enough that the content passes all the accessibility tests somebody wants to throw at them. There have to be accessible ways to read, or to play back the book, and there has to be a variety of options. Some students will want to access their learning materials directly online using the internet. Some will want to download an eBook to the computer: Windows or Mac. Some will want the same book on a mobile device or tablet. And some will want to be able to transfer it to a reading device, such as those manufactured by the assistive technology industry. Many will want to do more than one of those, depending on where they are doing the reading.

The DAISY Consortium and others are leading work on this, whereby different reading devices are assessed for their accessibility. These devices range from apps through to hardware e-readers.

The Book Industry Study Group, the IDPF and the DAISY Consortium have come together to conduct tests on as many EPUB-capable reading systems as possible. Go and have a look at:

http://www.epubtest.org

Similarly, we must ensure that the source from which an eBook is obtained is itself accessible. Again, it would be a shame if the e-book itself is fully accessible, but the website from which it is being obtained is not. And many of these sources currently force the reader to use their own bespoke reading platform, either software or hardware-based. If these reading platforms are not accessible, then it won't matter if the e-book itself is a model of accessibility.

Therefore, the distribution channels need to be accessible as well. In fact, the whole e-book ecosystem from production through to reading needs our attention.

These aspects of eBook accessibility are critical if we are not to drop the ball at the very point where the end user gets involved.

I'd like to move on by briefly touching on two areas where learning from online materials is evolving.

Firstly, the very concept of the eBook will change. The typical eBook is, in essence, just what it says: an electronic version of a traditional book. However, we're already seeing this traditional paradigm broken: the books are not just electronic texts, downloadable from a website. They're multimedia experiences, with audio, video and interactive features. EPUB3 is all about this multimedia capability. We need to ensure that all aspects of an eBook, not just the text, but the multimedia aspects as well are fully accessible to print disabled learners. Standards must be complied with, and developers must understand what those standards are.

There are many great online resources - try:
Accessible Publishing Best Practice Guidelines for Publishers
http://www.accessiblebooksconsortium.org/publishing/en/accessible_best_practice_guidelines_for_publishers.html
Or the Diagram Center's Top Tips for creating EPUB3 files: http://diagramcenter.org/54-9-tips-for-creating-accessible-epub-3-files.html

The latest development is happening in the Artificial Intelligence fields currently being opened up by players such as Amazon's Alexa and Google Home. We're already seeing a number of skills and applications for these devices which are interactive learning tools.

My organisation, the Blind Foundation in New Zealand, is currently developing skills for the Amazon Echo which will allow our library patrons to choose and read books from our library. It will support DAISY navigation as our other channels do, only in this case, the user controls the process using voice commands, rather than via a keyboard, keypad or standard DAISY player.

Another tool which we're collaborating on with a local developer is an interactive skill which allows the user to control how a story develops. Choices as to the way forward are offered at key parts of the narrative, and the story then branches off accordingly. This developer is keen to write educational skills which will assist in learning, via the Echo. This is at a very fledgling stage, but already we can see the potential for learners in years to come.

Lastly, most students, at some point, will find themselves doing an examination. Traditionally, these have been taken on paper, and print disabled students have had varying levels of support to access exams. This kind of exam is fast becoming a thing of the past. More and more countries are embracing online assessments: which are essentially exams via the internet.

In New Zealand, two blindness organisations have been working closely with the Qualifications Authority to ensure that the online assessments which all students will need to use in the near future are accessible to print disabled learners. We have been rigorously testing prototypes with mixed results.
It is essential that proposed assessment systems are thoroughly tested – not just with accessibility experts such as those employed in blindness organisations, but also by typical users – young people, teenagers, kids with mixed technology abilities. This is what we have been doing over the past year or so. This process has served to improve the online assessment tool the Qualifications Authority intends to use, but it has also educated them as to the importance of building accessibility in at an early stage.

I'd like to close by posing a few challenges to us: the print disabled learners and their supporters in organisations like mine and like the Hong Kong Blind Union.
Whether we like it or not (and we should), the eBook and online learning is the way things are going. We can't opt out of this. At the risk of being controversial, I suggest that it is no longer acceptable for our community to say: "I'm not technical; I'm not interested in using technology". Of course, there are reasons why some will find it difficult or impossible to do that and we must make provision for them.
However, for the most part, becoming confident users of assistive technology, so that we can become confident users of whatever is thrown at us by the mainstream world which is trying to respond to our call to make things born accessible is no longer optional.

Learning how to live independently, how to get around safely using mobiliby skills, and how to undertake daily living tasks such as making a meal have long been seen as required skills for most people in our community. I submit that the same is now true for those technology skills which will enable them to participate in the electronic and online world.

So, in closing, let's sum up how we ensure that the barriers to accessible e-books are removed.

- We need to deliver more mainstream accessible publications: this goes back to my earlier point about the need for blindness agencies to get out of the way of publishers and focus on what would still be hard to produce in the future;
- We must improve the efficiency of the customized accessibility publishers like the blindness agencies and allow us to focus on doing those things which are going to remain harder to do, particularly the demand for STEM. There is no reason though why our efforts cannot be fully integrated into the workflows of the mainstream publishers: that way, we can get them to help us to help them by placing the necessary structures and mark-up into their publications as part of their BAU workflow. That means the whole publishing process, from the author right through to the distribution of the final product should be thinking about accessibility;
- We need to modernize the whole copyright, legal and business framework under which we operate so that we no longer waste precious resources by duplicating each other's work. We need to stop the Harry Potter Effect. This is where the

Marrakesh Treaty comes in;

- We need to improve the current technologies which are used for publishing and for reading so that accessibility is built in. So our efforts need to focus not just on the published books but also on the devices which will play them: the complete distribution channel must be made more accessible than it currently is. Too many e-readers are currently unusable by print disabled people. And what we do know is that people are consuming their content in many different ways: from the almost traditional DAISY talking book players through to smartphones and tablets. Even the authoring process needs to be involved here: publishing software needs to expressly remind content authors and publishers to include accessibility structures in their files, and to nag them if they fail to do that;
- We need to ensure that mainstream publishers, technology platform and e-book developers understand the need for accessibility, and know how to implement it, or where to go to find out;
- We must ensure that print disabled people are coming on the journey with us. They need to be equipped with the technology, and the confidence to use that technology. Otherwise all our efforts will still only be of benefit to a tiny sub-section of the community who can both afford and use the technology they will need to access the content.

Blindness agencies are going to have to play their part in that process, but the publishing industry is going to have to make it worth our while.

Once again, thank you so much for your kind invitation. I'm looking forward to spending the rest of the day with you.