**Transcript for Accessibility Bites: Supporting Students Who Are Blind or With Low Vision**
**BCcampus webinar hosted on October 31, 2024**
**Presenter: Ka Li**
**Host: Helena Prins**

HELENA PRINS:
Good afternoon. My name is Helena Prins, and I am an advisor on the learning and teaching team here of BCcampus. I'm so glad that you chose to join the session today. We are covering the topic of supporting students who are blind or low-vision. Here to facilitate the session is the fabulous Ka Li. It's been such an honour getting to know you and I'm really excited for today's session. We're also joined by Paula Gaube. She's helping with tech support, and she will put some of the links in the chat as we go through this presentation today. Then I just want to acknowledge that I'm zooming in from my home office, which is on the unceded traditional territories of the Lekwungen People. I've lived on this island for 16 years, and I'm really thankful to them for their hospitality. Myself and my team, we are really committed to continue our learning and working towards reconciliation. I want to let you know that captions have been enabled. We are recording the session. If you don't want to appear on camera, please turn off your camera. You can also change your name just to "Participant." The recording will be shared publicly afterwards. We'll also share the recording, transcription, as well as a list of resources that Ka will share with us today. We'll share that with you in an email in the coming weeks. That's it from me. I'm going to stop sharing the slide and then it's all over to you.

KA LI:
Awesome. Hi, my name is Ka. I'm incredibly excited to be here today to talk about supporting blind and low-vision students. I'm an accessibility analyst working with a variety of organizations, including NNELS to ensure that websites, apps, and documents are accessible to users with disabilities who use assistive technologies. I specialize in image descriptions, tactile graphics, which I'll be talking more about later in the session and show you a few examples, and non-standard designs for interfaces. So I'd be coming up with solutions for products where standard web page designs with buttons and links might not work well. Think about things like video games and drawing apps where the interaction patterns are going to be very different using other types of inputs beyond a keyboard and performing tasks requiring different hand movements and skills. Even though all these specializations are tied together by the thread of accessibility, they can draw from uniquely different domains, such as HCI, human computer interaction, digital accessibility, and even kinesiology. The funny thing is my background is in kinesiology. I graduated last year with a BA in kinesiology and health sciences at York University. The funny thing is I actually never expected to take a kinesiology and health sciences degree. I started out in an information technology program, and because I love tech and I grew up with it, tinkering with computers and code. But just based on where my interests led me eventually, I ended up with this degree. And now I get to work on some pretty exciting projects with digital accessibility, tactile graphics, and novel interface designs. I get to leverage the background knowledge I gained with my kinesiology degree. But getting here though wasn't easy and there were many challenges throughout my university career. I hope today's topic will

highlight some of these challenges and share with you some solutions based on my own experiences as someone who's totally blind, as well as the collective experience of the blind and low-vision community, which I'm a part of.

But before I get started, though, I want to talk about the collaborative mindset. There are a couple of different approaches I've seen professors take. Unfortunately, I've encountered a couple of instructors who will do the bare minimum and really don't want to accommodate. But in most other cases, I found instructors to be accommodating and very willing to help. However, there are still differing approaches, and what I've noticed is that some will say that they're happy to help and just to let them know what I need, and others will engage in a continuous dialogue to ensure that I can participate fully in the class. The latter two approaches can work well, but it's the last approach, the collaborative approach that works the best, especially in complex courses requiring labs or practicums. The second approach puts the onus on the student to come up with the solution that will help them succeed in the course. But the collaborative approach puts the onus on both the student and the instructor to come up with the... to come up with the solutions. I find this to be less stressful, mainly because it's an ongoing dialogue where there is space for both the student and the instructor to contribute ideas and also having the space to adjust those solutions as the course progresses. The student may come up with knowledge on the types of techniques, tools, and strategies that work for them since they are an expert on their disability, but they might not know how well the tools and strategies and techniques will work in particular courses. Likewise, the professor isn't an expert on the student's disability, but they know the course content and objectives very well. By working together, this ensures that the solutions will be effective in their course. I can say from the student's perspective, I've noticed the level of engagement and even the way the whole space feels, the energy of the space, so to speak, feels very different based on those different approaches. I could tell right away whether the instructor was interested in helping or not. But with the collaborative approach, it was absolutely fantastic because I felt seen and welcomed in these spaces.

As I mentioned, students will come in with a variety of different skills, and I want to highlight the concept of blind and low-vision skills. These are additional skills that empower blind and low-vision individuals to be independent. If you do some research on this, you might hear it referred to as daily living skills, blindness skills, and the expanded core curriculum. There are several areas that blindness skills covers. So this would be independent travel, also known as orientation mobility, where we learn how to use a cane and analyze traffic patterns to cross streets safely, and so on. Braille skills. So this is reading and writing Braille, This is the technology skills. Learning to use computers, phones, and other technologies that can help in daily living, education, leisure and home management, so things like cooking, cleaning, organizational skills. These skills rely on, I think, different senses. So for someone who is low vision, they would be relying on magnification. But for someone who is totally blind, they would be relying on non-visual skills. This would be utilizing hearing, touch, smell, and so on. Unfortunately, due to the large geographic distances that we are in in Canada, and there are very few blind and low-vision service providers, the quality of instruction can differ greatly. Not

to mention, some individuals will have areas they are stronger in than others. As educators and anyone supporting blind and low-vision learners, it's really important to remember that each student is different and that what might work for one blind student might not work for the other. Now because there is... Blindness is a spectrum. Some learners will rely on low-vision skills, while others will rely on non-visual skills, and some will rely on a combination of the two. This is because they might find non-visual skills to work better in some situations than others. An example of this would be someone who will access text with Braille, but they might use magnification software to look at images. Another aspect to know is that there is a strong visual bias in relying on vision first and only using non-visual skills if they have no choice. Fortunately, the narrative is changing, but this does impact the solutions that students come up with where sometimes the trade-off might be less than optimal. An example of this going back to reading, if a student is using magnification and large print, they might get headaches and back pain because they're just so close to the print, and it might take them a really long time to go through the text. But if they were to use a non-visual tool, screen reader, text-to-speech, Braille, they wouldn't get headaches, back pain, and they might be able to go through the text just as quickly, if not quicker than their sighted peers.

Now let's actually talk about the types of tools, alternative techniques, and strategies that can work well. And I'll be talking about courses in general, but have a bit more of a focus on STEAM, science, technology, engineering, art, and math. As I mentioned, even though students... Each student will come in with different skills and are different, there are still patterns I've noticed where certain solutions will work for many students. For example, many blind students will use screen readers, such as JAWS and NVDA on Windows, VoiceOver on the Mac, and IOS, TalkBack on Android, or Orca on Linux.

They might use a refreshable Braille display for a hard copy Braille, and it would look something like this. [Holds up Braille display] This is what I've been reading my notes on, or they might be using a Braille embosser, which is a big machine that will create hard copy Braille like a printer, but for Braille. Some of these embossers can also produce tactile graphics, which I know I've been using that term a lot, so let's actually talk about that. Tactile graphics are raised line drawings that blind and low-vision people can use to access spatial information. I have a couple of examples here. And I'm just going to grab these. So Typographics come in various types of formats and different types of production. So in this picture book that NNELS has created, you can see that there's an image here. [Holds up image of leaf] There's Braille. So let's actually try to read this upside down. So this is an orange brown leaf. And so you can see the Braille and there's the leaf that has very good contrast. And this is what is what we call swell touch. So Swell Touch is a special paper that's been treated, chemically treated with tiny little pockets of alcohol. And when the alcohol or whatever chemical they use, I think it's more than just alcohol. But when it interacts with carbon, it raises up the lines when the page is run through heat or when a heat source is applied to it. That can cause some really great textures and contrast. The downside for that though is the paper can be very expensive. I would say about $2 per sheet. Making some of these Typographics books can be very expensive.

This is one of my favourite books. This is *Touch the Stars*, and it's all about astronomy. [Holds up book] Here, I think this might be a little bit more difficult to see, but this uses plastic paper, and it's called Thermoform. What this is, is just plastic that's applied on top of a master. The master would be the tactile graphic that the creator made using string, different types of textures, beads, whatever is going to work very well with the thermoform machine. What you would do is you'd put the plastic over the master copy. Then when you use the thermoform machine and apply heat and suction to it, you get a negative copy of the image, and then you also get some very great textures and resolutions with these images. There's one more example that I'm going to grab. And so this is a little bit more traditional. This is a book that was released by the MAD Lab from the San Francisco Lighthouse. [Holds up page from book] And this is all about different types of intersection crossings, and kind of gives you that bird's eye view of what they look like. Here it's using embossed Braille, but they've also applied ink to the page, I believe, so it can stand out visually as well for low-vision readers.

And again, there's all sorts of different trade-offs for the different types of production methods. Braille is the least expensive to produce in terms of tactile graphics. But the bulk of the course, when creating tactile graphics is just the expertise needed by the artists to make sure that the graphic is tactilely readable and that in certain cases, they're following certain guidelines. For standardized testing, the tactile graphic artist, if there are tactile graphics in the exam, they'd be following the Braille Authority of North America Guidelines. So in some pretty complex subjects. In my undergrad, I had to take some kinesiology courses, of course, where they also wanted biology, and they also wanted human kinetics and looking at the physics of muscle movements. They might also want as prerequisites, the physiology as well. All these things, I think you can imagine there's tons and tons of diagrams, and so having tactile representations of them is incredibly useful. Unfortunately, though, a lot of school systems, a lot of campuses aren't very well equipped to provide tactile graphics, so they might have to outsource them to specific companies. But sometimes I've gotten these tactile graphics in maybe half a semester after the course has started. That doesn't work very well. I've also learned to create tactile graphics through drawings that you would make yourself.

This is what we call a Sensational Blackboard. [Holds up Blackboard] All it is, it's just a piece of rubber on a silicone background. Basically, I don't have a paper here, but pretending that this cover is the paper, you would place it on there, and then you would use a ballpoint pen or a stylus and just draw on it, and then you would get instantly raised lines. For me, in order to communicate through drawing or to be able to get instant access to diagrams, I would use something like this, working with the professor and with my other peers to draw. Then I would use a Braille labeller or a Slate and Stylus to be able to create Braille labels and to place them on there. So this saved me, I would say, while I was waiting for the tactile graphics to be done and shipped.

So in terms of course content, we've covered text, we've covered images. One thing that I haven't really talked about so much is video. In videos, there sometimes is a lot of visual content that isn't being described or there aren't sounds to communicate all the details of

what's happening. We have something called audio description. Audio description provides a separate track that provides narration on the visual aspects of the video that you can't pick up on just by hearing it. Actually, a lot of movies now, a lot of well-known movies are audio-described. If you go to your local theatre, you might see something that says AD or video description, and so that's what that is. For university classes, a lot of those videos were not described. One of the solutions that I've figured out is working with the instructor to use something called YouDescribe. YouDescribe if the video is on YouTube, you can YouDescribe to add a separate track, and audio descriptive track to that video, and that will play as that video plays. There's something called inline description, so that's describing things between the spaces as the video is happening. You can also use extended description where you can pause the video and give a fuller explanation of what's happening on the screen. There are other videos I've noticed that the instructor might use where it's not on YouTube and they're concerned about copyright and things like that. And so one of my instructors figured out that if you stream the video on Zoom and record that, and then also build a play and pause the video, you're able to add descriptions that way, and then he was able to post that video up on the learning management system. And so there are some pretty ingenious solutions that we've all had to come up with to make things work.

Let's actually change gears a little bit and talk about lab work. There are many different types of labs and most of the labs that I've done have been dissection labs or working with measurement equipment to calculate like reaction time and things like that. And so unfortunately, a lot of the equipment isn't very accessible. You can use an AI app to generate an image description or to try to read the display on these devices. And back when I took these labs, generative AI wasn't really a big thing. We still had OCR apps, being able to take an app on a phone and use the phone to try to read the text through optical character recognition, but that didn't work very reliably. Now that we actually have all these different tools, these generative AI tools to take a picture and to have that picture be described, I think it's going to open up much more access in this way. For dissections, one of the things that I've learned through one of my mentors is that if the instructor is trying to show something and it's very tiny, you can actually use needle and thread to hook onto that little component, and then if the blind person follows that thread, they can find where the instructor is referring to. The instructor I worked with used the probe, and even though there were initially some concerns about how small some of those components were, I was able to use my hands, and my fingers to be able to feel all the different characteristics and to take notes of being able to identify all the different parts. In terms of chemistry labs, I didn't do a lot of those. But many of my friends who did take chemistry and some of whom actually have organic chemistry degrees, PhD organic chemistry degrees. They tell me that there's a lot of equipment that can be used accessibly without much adaptation. It's just learning the non-visual techniques to use them. That will take a little bit of time. It's not anything complex. Actually, one of my friends said, if you know how to cook and you've learned a lot of those basic cooking skills, you can do chemistry. So that's the deal with chemistry. There's something called the Talking LabQuest. That's a handheld device where you can connect sensors. When you stick some of these

sensors in the solution, it will give you audible feedback on colour change and different values and you can log it and graph it, and things like that. That's incredibly helpful.

I've covered a lot here and have shared a lot of different solutions. So I think I'll open it up for questions and see what you all have as questions. Yeah, appreciate being here again, and thanks for having me.

HELENA: Thank you, Ka. So everyone. I see Elliott, your hand is raised. Elliot, you go first.

ELLIOT:
Hello Ka, this is Elliott. Thank you so much for this great presentation. I'm a librarian at the University of Washington in Seattle. Something that I'm curious about is, if you have any opinions about the accessibility of digital scholarship platforms that college students might use in classes? For example, like in what little I know about accessibility testing, it seems like things like WordPress and Pressbooks for making a website or a digital book are more accessible than other platforms like Omega and Scalar and Manifold. So I'm just wondering, from your perspective as a student or as someone who is testing things out tech wise, like, what do you think are the most accessible platforms for students to make things like a website or a digital book or a digital exhibit?

KA:
Yeah, that's a great question. I think I would say for websites, sometimes hand coding can be really easy, especially if you're not using a lot of complex visual layouts. But generally, for me, I found something like Drupal or WordPress to work very well for projects like that. But in terms of scholarship journals and notebooks, I haven't had to use them in quite a while, so I'm not sure what the state of accessibility for them right now is.

ELLIOT: Thank you.

HELENA:
And there's a question from Jennifer. She said, "I'm curious about tools for math problems. I can see using the Sensational Blackboard you mentioned for graphs, etc. But what do I need to know about doing algebra?

KA:
Oh, great question. So I took a lot of math in high school, and we used, there's embossed graphing paper, there's wiki sticks to create images as well. These are just little sticks of wax that you'd be able to stick on. So for a lot of graphing and showing different concepts, that can also be really useful as DIY tools. But I would say for math and really for algebra, you know, using, relying on Braille notation, mathematical Braille notation is going to really be your friend in being able to understand all the different equations and be able to manipulate them. The way that I did math was probably not the most efficient way. I would write equations on a Braille display, and then they would get transcribed by a Braillist. And then that would be that

back-and-forth process. Now, math can be done more digitally with MathType and using Microsoft's Equation Editor and be able to plug in the Braille display to the computer to be able to work with the screen reader to use those features.

HELENA:
Wow. This was the fastest 30 minutes ever. You gave us so much incredible information in there and I'm really thankful that you started with the reminder of the collaborative mindset, that this should be a dialogue between instructor and student. I want to thank Ka because he also put together a resource for some of the things he spoke about today that we will share with the recording. If you're a registered participant here today, you'll receive that in your email in the coming two weeks, the recording, the transcript, and there will be a resource with a lot of links that Ka has prepared for us. So, Ka, I see a lot of appreciation in the chat for your session. I want to thank you for being with us today, and everyone else, go enjoy a wonderful Thursday.