JACLYN LEDUC: Thank you for joining us today for this webinar entitled "Accessible Educational Materials as a Foundation for UDL." And UDL stands for Universal Design Learning. My name is Jaclyn Leduc. I'm from 3Play Media. And I will be moderating today.

I am joined today by Luis Perez, a Technical Assistant Specialist at the National Center on Accessible Educational Materials at CAST. And with that, I will pass it off to Luis, who has a wonderful presentation prepared for you today.

LUIS PEREZ: Perfect. Well, welcome, everybody. It's great to see such a nice turnout for this webinar. And a big thank you to 3Play Media for allowing us to come to you this afternoon. As Jaclyn said, I'm a technical assistant specialist at the National AEM Center at CAST. AEM stands for Accessible Educational Materials.

Just a little bit about the AEM Center and our mission and goals-- our mission is to improve learning opportunities for students with disabilities. And the way that we do that is by working to increase both the availability and use of high-quality, accessible materials and technologies. We work with a range of stakeholders in that work, ranging from states and districts, to higher ed institutions, to workforce development agencies. We do a lot of work with publishers and their tech developers. And then finally, families and users of assistive technology are also some of our very important stakeholders and allies in this work.

Now, the AEM Center is a federally-funded technical assistance center. It is funded by the Office of Special Education Programs at the US Department of Education. But we are based at CAST. And CAST is a nonprofit based in Wakefield, Massachusetts that has a singular mission or ambition. I like the word "ambition" better. And that is to "bust the barriers to learning that millions of people experience every day." And the way that we do that is by implementing the Universal Design for Learning principles, which I'll cover in more detail later in this presentation.

And so what we do at CAST is we help educators and others who work in education apply insights from the last three decades or so of the learning sciences and then leading-edge practices that we've learned about from classroom teachers. And we try to apply those insights and best practices to design more inclusive learning environments. So that is our mission.

CAST, as I said, is based in Massachusetts. I am not. I am coming to you from St. Petersburg, Florida.

The goals for today's webinar-- first, we want to make sure that we share a common language

when we talk about accessible educational materials and technologies. So we're going to spend a little bit of time on that. We're then going to talk about the benefits of AEM, why it's so important to provide all students with AEM. Again, that's Accessible Educational Materials. And then I also want to share with you some resources from the AEM Center that I think you'll find helpful to further your own understanding and learning of AEM and accessible technologies.

So that's my goals for today. But I'm more interested in what your goals are. That's something that we try to do when we practice Universal Design for Learning is to make the learning as relevant and meaningful to our audience as possible. So using the chat, what is one thing you would like to take away from today's webinar from what you know from the description and the emails that you've received? So go ahead, and see if you can find that chat pod. And then just let me know, what's one takeaway that you hope to leave this webinar with?

Great. So JC says, "how to do UDL, what existing resources are there?" Lawrence says, "continuous learning for inclusive teaching." Well, you've come to the right place, then. Great. I see lots of great suggestions coming through. So it looks like there's a lot of interest in Universal Design for Learning. So that's awesome.

Well, keep those coming. I'll continue with the presentation. And just keep those as a reminder for yourself at the end as you formulate your questions. I want to make sure that we make this webinar meet your needs as much as possible.

All right, so Simon Sinek, who's a well-known person in the world of leadership, if you will, he says that it's always important to begin with a why. And so that's one of the things I want to do today is begin with a why. Why is AEM important? And then talk a little bit about the legal requirements that are involved.

So in terms of the legal requirements, AEM is an important component of meeting those requirements of equal opportunity for all learners, equal treatment. These are key principles that are the foundation of civil rights legislation such as the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. So when we provide AEM, we are living up to those ideals of those important pieces of legislation.

And so it's about equity, really. That's the big umbrella here. Equal opportunity, equal treatment-- these are all ways that we can secure equity in our educational systems.

And for me, this is the big why, too. I know that we've made a lot of progress over the last 26,

27 years since the ADA-- actually 29 years, soon 30 since the Americans with Disabilities Act was passed. But we still have some work to do. And so if you look at statistics like enrollment in college or completion of a college degree by students with disabilities compared to students without disabilities, we still see some gaps there.

And for me, this is one of the biggest gaps is the workforce gap. And so we can see from this statistic here that, according to the US Department of Labor, the labor force participation is much lower for people with disabilities than it is for people without disabilities. And then the unemployment rate follows a similar trend, where it's about twice that of people without disabilites. For people with disabilities, that is, it's about twice that of people without disabilities. So we do have some work to do in this sense.

So why AEM? I would summarize it with just three key points. One is that it's about ensuring equitable access to learning. So when we provide students with AEM, we provide opportunities to just fully participate and make progress in the curriculum. It's also about providing all learners with options. And we'll talk about that as a key component of the Universal Design for Learning.

So as early as possible, we want to expose kids to the different range of technologies that are available for access, the different types of resources so that, over time, they develop their own learning preferences. And so this is key for when they get to college or the workforce, where they need to be able to articulate what their needs are, and they need to be proactive and be able to express what their needs and preferences are. So this is a key component of preparing students for that transition from K-12 into higher education and the workforce.

And then of course, we've already discussed this, but it's important to provide AEM in order to comply or conform with federal laws and regulations. In K-12, that would be the Individuals with Disabilities Education Act. And then we also have the civil rights legislation that I mentioned, Section 504 in the Americans with Disabilities Act.

[DOG BARKING]

Give me one second, folks. I apologize for the noise. I have a puppy here. So give me one second.

Sorry about that, folks. I was hoping that he would be good throughout the session. But apparently, that's not going to happen. So I've put him in a different room.

All right, so as I was saying, AEM is important for all of these reasons, equity, providing learners with all options so they can find their best learning preferences, and then, of course, conformance with federal laws and regulations.

So now that we've discussed a little bit about the why, we're going to talk about what of AEM and UDL. So what do we mean when we say something is accessible? What makes materials and technologies accessible? And then, how does accessibility fit into Universal Design for Learning, or UDL?

So again, I'm going to use the chat. So if you were to tweet out right now a definition of accessibility-- and I've provided you here with a shortcut for accessibility, which is A-11-Y. And the reason for that shortcut is that there are 11 letters between the A and the Y in accessibility-- what would you tweet out? So I'm always interested. I'm sure with this audience we have some real experts in the audience. So what would you tweet out as a one-sentence definition of accessibility?

I love the definitions that are coming through-- "removing barriers to educational resources." We love that-- definitely about barrier-free access. I see a trend here, which I love, which is all about removing barriers. "Equitable access to facilities, materials, and things"-- so I see some great trends in your definitions-- "equal access." Keep those coming, everyone. I appreciate your sharing with me your thoughts on this.

So let me share with you one definition. And this is the definition that we share from the National AEM Center when we do these presentations. And this comes directly from the US Department of Ed and their Office of Civil Rights.

According to this definition, accessibility is when a person with a disability can do three things. They can acquire the same information, they can engage in the same interactions, and they can enjoy the same services as a person without a disability. And they can do this in an equally effective, equally integrated way and with substantially equivalent ease of use.

And so that generally means that they will have access to the resources at the same time as their non-disabled peers. So that's really important. That's part of that equally effective, equally integrated manner.

And so you'll notice that this is a functional definition of accessibility. It focuses on what people should be able to do as opposed to their diagnosis or the label that they've been assigned. So

that's one of the reasons why I love this definition so much because it really focuses in on that functional definition.

So just a few key terms here-- and this is confusing sometimes because in many states, they still only refer to Accessible Educational Materials, or AIM. So this is a term that comes from the Individuals with Disabilities Education Act when it was reauthorized in 2004. And it really relates more to print materials.

So as it says in the definition, it requires states and local educational agencies to ensure that printed textbooks are provided to learners with print disabilities in specialized formats and in a timely manner. So this is what's in that very important special education law, the Individuals with Disabilities Act. So it's related to print.

And what's really important to point out is that, under IDEA, the legal requirement is placed on the states and local educational agencies, not on the publishers. And so it's important for those who are making purchasing decisions at the state or LEA level, they need to put in these requirements in their contracts and purchase orders. And at the National AEM Center, we actually have sample contract language. And so that will help those purchasers at the state or local level ensure that they're including these requirements when they make these contracts with publishers.

And a big part of IDEA is the National Instructional Materials Accessibility Standard. So this is basically a digital file format for publishers for when they get requests for specialized formats. Now, a NIMAS file or file set is not something that is student-ready, because it's an XML file. So it's not meant to be distributed directly to students.

What happens is that, when a publisher gets a request to create a NIMAS file, that file is then deposited into the NIMAC, or the National Instructional Materials Access Center. This is located in Kentucky at the American Printing House for the Blind. And then from those NIMAS files, a number of Accessible Media Producers who are authorized can then make student-ready files.

So again, the NIMAS file is an XML. It's not student-ready. It's not ready for consumption. It has to be converted first into a final format that students can use.

And there are four formats that are specialized formats for print. And again, these are the ones that can be derived from that NIMAS file. They are Braille, large print, audio, or digital

text.

[DOG BARKING]

One second, everyone. OK, sorry about that.

So what's important to note here-- with any of those specialized formats, students are getting the exact same information as the print materials. The only thing that changes is the presentation into a different format. Usually, the format is a little bit more flexible, and that can be adjusted for their specific needs.

So these are just some examples of sources with specialized formats. These are called Accessible Media Producers. So they can, in many cases, access those NIMAS files. And then they convert them into the specialized formats that students need.

So Bookshare-- I'm actually a Bookshare user myself. These are digital books that I can access on my tablet, on my phone. And then I can use text to speech with them. I can adjust the text size and so on.

LearninyAlly are audio books. So they have human narration. But many of the LearninyAlly books also support the ability to send a text at the same time.

And then the American Printing House for the Blind also produces some large print and Braille resources for students who are blind or have visual impairments. And then many states also have instructional materials centers where they do this conversion. So they're able to download those NIMAS files and convert them into those specialized formats.

So as you know, things have changed with technology over the last 10 or so years. We've gone to more digital resources. And so in 2015, AIM, Accessible Instructional Materials, became AEM, or Accessible Educational Materials. And really the big change here is that it wasn't just print anymore. It was also technology-based educational material, so basically digital materials. And so now AIM was expanded to include digital materials and technologies.

So I just have a screen here that summarizes that. So just think of AEM, or Accessible Education Materials, as an umbrella term. It includes print which comes from IDEA, and specialized formats of print materials. And then starting in 2015, it expands to include digital materials and technologies.

So let me pause there, see if there are any questions before we continue. I'll go ahead and take a question or two. If not, that's OK. Just hold on to those questions until the end.

And we'll keep going here. So I just want to make sure that people are clear on these terms before we continue.

So as I just said, now we're also going more into the digital realm. A lot of publishers are actually going digital first. So that's something you'll probably continue to see as a trend.

But when we talk about digital materials, we need to be considerate of interoperability. So when we talk about accessible materials, we are talking about two things. One is the materials themselves. And that's the information or the content that students are going to be learning. And then the other one is the accessible technology that they're using to access that content.

And both of these need to be accessible. They need to be designed in a way that accommodates the variability that learners will bring into the classroom.

And in the case of technology, the technology has to be usable with or without assistive technology. So it needs to be usable by people with a wide range of abilities and disabilities. So that interoperability is really important. You can't have one without the other.

You have to have the access technologies for learners to actually make use of that information. And at the same time, you can have the most powerful access technologies. But if you haven't designed materials with accessibility in mind from the start, then it doesn't quite work as well.

So here's an example that I use. This is an example that I rely on quite a bit, personally, because I'm a person with a visual impairment. And I often read my books on a tablet by selecting books that are in the ebook format. So this is a format that has been created with accessibility in mind.

And so when I access that accessible ebook on an accessible tablet, I can use a range of options. I can adjust the display. And that can mean everything from changing the margins, the line spacing, the colors, the text size, and so on. I can use text to speech, typically to give my eyes a rest, especially when it gets later in the day. And then, depending on how tired my eyes are, I may switch to a screen reader and just listen to the book that way.

The other thing is a number of individuals can use the Bluetooth that's built into these devices

to connect the Braille display. And so then they can access that digital book using a refreshable Braille display. Or a number of these books now include embedded media so that it brings that content to life. And it just provides a lot more of an immersive experience.

And so if you have a video or an animation, if that animation has been created with accessibility in mind, the user can turn on closed captions to support not only maybe a hearing challenge that they have but also maybe a literacy one. They may be an English language learner, which I'm also in that category, even though I've been in the United States for a while.

Or if they're blind, they may turn on video descriptions so that they can listen to the content. And that doesn't just benefit people who are blind. It also benefits multitaskers. So if you can't look at the screen, and you're doing something else, you could still follow along with those video descriptions. So there are a number of benefits when we build accessibility. And we do it in this way where we reach that accessible material and technology harmony.

And now I'm going to just discuss a few of the AEM Center resources. One way that we can build accessibility from the start is by following some best practices. And one of those best practices or standards is the Web Content Accessibility Guidelines, which are currently at version 2.1.

And those guidelines are built on top of four foundational principles, Perceivable, Operable, Understandable, and Robust. And when you put those principles together, they make up the acronym POUR, P-O-U-R. And so basically, you want to make sure that everybody can access the information.

So again, if we go back to that US Department of Education definition, you must be able to perceive the content, meaning you can access it independently. You must be able to operate the interface in the content-- so again, being able to engage in those same interactions as a person without a disability. And this means you should be able to navigate. You should be able to tell where you are and so on.

The content needs to be understandable. So whenever you use a new term-- the first time you use the term-- it should be defined. And then the reading levels should be appropriate to the audience that you are speaking to.

And then robust-- it just means that it works on a range of devices. So it's not limited to the desktop. It will work just as well on a mobile device. And it's been checked so that it follows

best practices, and it's coded correctly, and so on.

So the icon that we have here is an icon that our team created at the AEM Center. And it shows the same content on a range of different formats and devices, ranging from a book with Braille, to a mobile device, to a monitor. It shows a keyboard, as well as a switch device that somebody with a motor challenge might use to interact with their computer. And then, again, on a phone, somebody is accessing the content with text to speech.

So we have a section of our website. It's called Designing for Accessibility with POUR. The audience for this section of our website really is educators. So we've tried to take the principles and practices of the Web Content Accessibility Guidelines and those POUR principles and really put it into a very practical organization using very plain language-- as plain as we could make it-- so that, again, it's appropriate for our audience. And we want to make sure that it's actionable and it gets people doing the right thing when it comes to accessibility.

So we have a page for each of the principles. And then within each of those principles, there are links to closed-captioned videos and other resources that help our educators implement these practices as they develop things like worksheets, instructions for their students, whatever they're using in their curriculum that needs to be accessible, which should be everything. Then they can turn those materials into accessible ones following these practices.

Similarly, this past year, we offered an online course. And that course was synchronous over the course of a year. But we've now archived it on our website. So it's available for access anytime.

It has closed-caption webinars for each of the five modules that we offered. So it goes from module 1, which provides a very general introduction, similar to the one that you're watching right now.

Module 2 focuses on documents and presentations. We know that's something that teachers create in the classroom, usually on their own. So it's not something they acquire from somebody else but something that they're creating themselves. And so we want to make sure that they do that with accessibility from the start.

Module 3 should be of interest to all of you coming to a 3Play Media webinar, because it's all about captioning and audio description-- so making sure that, as teachers select more interactive content, videos, animations, and the like, that they're following best practices.

And then the rest of the modules really focus on-- one on print, how to acquire specialized formats, and then the other one, digital materials, including open educational resources.

So I highly encourage you all to check out this course. We've designed it to be really flexible, so it has different levels. We're trying to meet educators where they're at in terms of their readiness. So there is an entry level, a build level, and a more advanced level. So there's different options for people to learn about accessibility.

And then, as I mentioned just a second ago, it's not enough to just make sure that the materials are accessible. But we also need to have accessible access technologies. And there, I used access twice. It's that important.

And so we have a page called Personalizing the Reading Experience. And this highlights all of those features that are now built into our computers, our tablets, our phones, and even our smart speakers, which I have a couple of them here with me. And so I've gone through and just highlighted all of the different options on all these different platforms that learners can use to access content, whether they're at home or at school.

So that's a little bit about accessibility, some background information and also just kind of a hint at some of the resources you'll find at the National AEM Center. But I want to switch the conversation now to Universal Design for Learning. A lot of you had some interest in this. So I'm really glad that we're having this conversation.

So in the chat, if you had to provide an elevator pitch for UDL, what would you say? So this will help me gauge a little bit what you know about Universal Design for Learning. So go ahead in the chat. Pretend that you're on, let's say, a five-floor building. And you just have five floors to share this information with somebody.

Let's see. So we have some nice responses coming through-- "helps with retention." Diane says, "by thinking of everyone's needs and wants, you make learning better for everyone." So that's definitely that universal design philosophy-- essential for some, almost always useful for all.

I'm seeing the word "choices" come up a number of times. So that's great, great to see that. Sandra, I think, has worked at CAST before because she has a great definition-- "a framework based on learning science"-- so we love to see that-- "that can be used to develop educational experiences that support a diverse range of students." Wow, you packed a lot into that

definition. That's really great.

Karen has a great one, too. She says, "UDL, or Universal Design for Learning, is Invitational design." Oh, I love that. I'm going to steal that, Karen. "It welcomes all students and helps them be ready to optimize as requested." These are all amazing definitions. So thank you again for sharing them with me.

So here's one definition that aligns really well with the one you shared, Sandra. Universal Design for Learning, or UDL, it's a framework based on scientific insights into how humans learn that seeks to optimize instruction in order to allow every person to become an expert learner. So that's probably a part of UDL that many people have not seen is that part about expert learner.

And that's really what makes UDL a framework for everybody. Because one of the key principles of Universal Design for Learning is that we all vary. In every classroom, regardless of the demographics, regardless of whether you have students who have been identified with a disability or not, there is great variability. And learners will vary in how they're motivated, what's interesting to them, the level of challenge that they want, how they take in information, and how they're able to express their understanding.

So part of Universal Design for Learning is to really create a curriculum where we're optimizing instruction. We're providing the optimal level of challenge or support. So it could be either one-- challenge for some, support for others. And we'll build those in from the start in a very proactive way.

So as Sandra, again, mentioned, this Universal Design for Learning framework is based on the learning sciences and what we've known or learned about the learning brain over the last 20 or 30 years. And what we know is that there is three dimensions along which learners vary. They vary in their affective networks. Their why differs. Or people have different motivations for why they want to learn something-- what's interesting to them or what's threatening to them, as well.

People vary along the recognition network-- so again, how they take in information, the what of learning, the content. And then they also vary how they're able to show their understanding. And that's their strategic networks.

So in order to accommodate that variability, with Universal Design for Learning, we try to

provide options or choices with the understanding that a one-size-fits-all curriculum, it's really a one-size-fits-none curriculum. So instead, we try to provide flexibility and options. And we try to provide multiple means of engagement-- so again, multiple entry points, multiple pathways to learning, multiple representations. So we show the information in a variety of different modalities and then multiple means of action and expression. So as opposed to just composing an essay, students might be able to create a video or record a podcast where they share their understanding in a way that not only may work better for them but also builds important skills that they may need in the future in a technology-based economy and society.

So at CAST, one of the ways that people implement Universal Design for Learning is through the use of a tool called a UDL Guidelines. And they've been recently updated. So I want to spend a little bit of time here on how accessibility fits into the Universal Design for Learning Guidelines.

So the UDL Guidelines, in the latest iteration, was split into these levels or layers. And it begins at the top with the access layer. And then it moves through a build layer, and then, finally, an internalized layer.

So within the access layer, this is really what, often, people limit Universal Designed for Learning to. This is the foundation. And it's essential, but it's not sufficient.

So it's important that we recruit interests and that we provide options for perception. If you aren't able to perceive something, then you won't be able to make meaning out of it. And it's important that learners be able to interact with their learning environments. So it's essential that we provide access through Universal Design. But again, that's just the foundation.

At the next layer, at the build layer, then we need to focus on building those learning skills for the future. And so this is where we focus on making learning meaningful by providing supports for communication, for collaboration, for developing language, for sustaining that effort that we've recruited in the previous layer. Because there will be challenges that will arise while you're learning, and that's OK. That's part of learning is to be challenged. It just has to be the optimal level of challenge.

And then the final layer, the internalized layer-- here, we're building independence. And the idea is that we're internalizing those learning behaviors that we've built in the previous layer and those learning skills so that we're creating learners who are self-regulating. They're self-motivated. They have good executive functioning, meaning that they're able to set challenging

goals. They're able to monitor their progress, and they're able to make course corrections as needed.

So on the CAST website, there's a really nice video for the UDL Guidelines where Dr. David Rose, who was one of the developers of the UDL framework, really explains how this moves from the outside in-- so from your interactions with the environment to what happens more internally to learners. And the goal really is to move towards learners who are expert learners. And that's that internalized layer.

So they're knowledgeable, but they also know how to get more information and how to make sense of it. They don't rely on the environment to motivate them. They're self-motivating and self-regulating. And they have great executive functioning. So they're able to carry out these plans successfully.

A friend of mine jokes that, really, when we get to the bottom of-- in this orientation, the bottom of the UDL guidelines, these are the "get your kids out of your house" skills. And this sits very nicely with me, because I just have a child who just went off to college. So having these skills is really essential for being independent in the world-- being interdependent, I would actually say. Because it also involves working with others and for others.

So I want to share with you this quote that I love from the Universal Design for Learning Guidelines, from their introduction. And it says that "the purpose of education is not to make information accessible, but rather to teach learners how to transform accessible education or information into usable knowledge."

So that's just another way of saying what I just stated a little while ago, that accessibility is foundational to UDL, especially for learners with disabilities. Without accessibility, there is no UDL. You can provide all the options, all of the choices that you want. But if learners can't access them, we're not really giving them a true choice. So we want to make sure that those choices are accessible to all learners.

So again, accessibility is foundational to UDL, but it's not sufficient. Because UDL is really about learning and developing expert learners who are purposeful and motivated, resourceful and knowledgeable, and strategic and goal-directed.

So just like the UDL principals, we've looked at the what, the why-- well, actually we started with the why. We then looked at the what. And then we talked a little bit about the how, which

is the Universal Design for Learning Guidelines.

The one thing that I would say about the UDL Guidelines is that it's not a prescriptive checklist. It's not something that you take a resource or a curriculum, and you go through, and make sure that you meet every single checkpoint. As a framework, it is more of a heuristic or a tool for studying the curriculum and being innovative about it so that-- what I recommend typically is that a group of educators take the UDL Guidelines and translate it into language that makes sense to them.

And in fact, on the CAST website, we have a blank version of the Guidelines without the checkpoints that educators can download. And as they learn more about the Guidelines, they can fill it in their own language with examples that make sense to them. Because UDL is very contextual. It will vary on the different constraints and realities that you have within your given educational setting.

So that's the first thing. It's not a checklist. It's not prescriptive.

But also, UDL itself is not something you buy. It doesn't come in a box. It's really a practice and a mindset. And so it's just a different way of thinking about the curriculum.

And it's something that develops over time. So it may be overwhelming at first when you look at those guidelines. But you can take one of them and implement them in your environment. And it will have an impact on learners' experience.

And then over time, you can take a plus-one approach, to quote my friend Thomas Tobin. And over time, you can add more of those guidelines until it just becomes a way of thinking. It's something that is more second nature to you.

So lastly, it's also important to remember that who of AEM. And this is really important to me, because, myself, I am a person with a disability. So it's important to remember why we do this and why I do this. And it's the learners. It's making sure that they have access to a good life, that they're able to exercise their rights in our society.

So on the screen, I have a number of different use cases for AEM. We have a student who's using a magnifier on the desktop to access the information. We have somebody using sign language on a video that also has captions.

We have a couple of people using Braille. So one is using it in a hard copy. The other is using

a Braille display on the go.

We have a student listening to the content in a computer lab at school. And then we have a student who is using switch access. And she's in a wheelchair. So these are all examples of that great variability that comes into mind.

And Natasha made a great point here. We should always have users first in mind. Absolutely. That's how we're going to develop the best solutions. And the same goes for Universal Design for Learning is you have to engage your learners in the process of design or co-design-- even better. And so there are ways to do that, as well.

So the final question that I want to leave you with here-- and we can have some discussion about this. The key question to me always to consider is, can the learner access and use the same materials and technologies that have been selected for the general education curriculum to support their learning? So can all learners do this, including those who have disabilities, those who are English language learners, and so on? That's the key question to me.

And I've been a great beneficiary of accessible educational materials. Without them, I would not have been able to pursue my education. And that really drives my passion for working in this field. And it also gives me a lot of hope and excitement because there are great things happening.

The technology is getting better. There are more tools for us to create accessible materials so that even the classroom teacher who is not technical in nature or is not tech savvy-- or so they say until you start working with them-- they can do this. And it's our hope that some of the resources at the AEM Center facilitate that process.

So with that, I am right at 2:45. So we have a few minutes left for any questions. You can always reach out to us. So if you have specific questions that you want to run by us, you can always email us at the AEM Center. We are at AEM@cast.org.

You can call us. We have a number. You can leave us a voice message-- 781-245-2212.

Or an easy way to connect with us is through social media. We're @AEM_Center. Or you can like us on Facebook. We're @AEMCenter there, as well-- so different ways you can connect with us.

So I'll open it up, see if there are any questions or comments for me. I see one already from

JC. "What are the considerations for cognitive disabilities?" That's a great question, JC.

This is something that's getting more and more attention. And so I'm glad that you brought it up. Because traditionally, when we've talked about accessibility, the focus was on screen readers at first or keyboard accessibility. And of course, both of those things are important. But we also need to address those cognitive considerations.

So for instance, there are ways to check the reading level. This is built into Microsoft Word, even. When you do a spell check, there is an option for checking the reading level. And there are online tools that you can use to check the reading level, as well. Hemingway app is one that I've used in the past. And there are guidelines for plain language, as well, from the US government. So all of those things basically address some of those cognitive considerations.

But also, in terms of Universal Design for Learning, think about how different media support each other. So adding images might support somebody who's an English language learner. And I'm sharing that from personal experience. Because when I first came to the US, I didn't speak English at all. And so having visuals was really helpful to me. So just creating those flexible materials that have visuals, that have instructions in audio and in different ways can be really helpful. So thank you for that great question, JC.

Let's see. We have a couple of other questions here. "To what extent is EPUB accessible?" So one of the challenges with EPUB of is it depends on the reader that you're using. Different readers have different options.

So I will tell you that I use EPUB books on iOS. I use an app called Voice Dream Reader. And so that's an app where I can open up EPUBs. And it has lots of options.

It's not a free app, unfortunately. It's, I think, about $15. But it's well worth it because I'm able to connect my Bookshare account to that app. And so in addition to EPUBs that I can purchase from other places, I can also download ones from Bookshare. And it has just a lot of customizations that I can use to create the learning environment or the reading environment that I need.

On Windows, I use the Edge web browser. And in there, there's a read aloud feature along with Microsoft's learning tools. And again, that allows you to listen to the content with text to speech. And then also, you can customize the fonts, the colors, and so on.

So there's lots of options out there. There are places where you can-- I think the BASIC

consortium has a list of the different readers, so you can find out more about the options for accessing EPUB. But it is my preferred format right now for reading content, personally.

So the next question is, "are there any websites or resources that aggregate publishers who are doing a good job with accessible materials?" Definitely. We try to do that as much as possible. But inclusivepublishing.org Is another place that you can go to to find out information about what's happening in that area.

The next question here is accessibility of science and math-- great question. I think it was Natasha that asked that one. This is an area that's challenging. And the issue is we have technology to make math accessible.

There is something called MathML. It's similar to HTML that you use to create web pages. But it's a way of coding mathematical expressions so that they work well with assistive technology.

The challenge with MathML is the support at the browser level. So for instance, there's a very popular browser that's used throughout education called Chrome that does not natively support MathML. So then you need to go to work-arounds. There is something called MathJax that allows MathML to work across different browsers. But again, we were ideally want it to be natively supported. So if you're interested, we do have a page on the AEM Center website that talks a lot more about MathML and how to get started with that.

Let's see. I'm just looking through the questions here. Give me a second. Since I am visually impaired, it takes me a while to go through these.

JACLYN LEDUC: Luis, I have a question here. And I can read for them for you, as well.

LUIS PEREZ: Please, if you could help me out.

JACLYN LEDUC: Yeah, no problem. I know it's hard to sift through all these questions. So the question is, how do you help stakeholders understand the requirements of UDL?

LUIS PEREZ: Well, part of it is you can't just tell somebody about Universal Design for Learning. That's not quite the way it works. So one of the things we can do is to model it.

And it's a little bit difficult to do that in this kind of environment. But whenever we do live workshops, we try to model UDL as much as possible. So we have people come up with their own goals. And I hope you did that at the beginning of this session. So now this is an

opportunity to go back and revise those goals and see how I did in meeting them. If I didn't, then this is an opportunity for you to raise questions.

So modeling things like chunking the information is another thing you can do that helps people kind of take a breather every once in a while. And so that's why I paused at the middle of my presentation today to make sure that you had a chance to ask questions, and just step back, and take a breather. And in some cases, my dog here forced me to take a breather as well.

Modeling the use of different media-- so all of these things really help people realize on their own that this is a great way to learn. So it's not enough to just say, this is UDL, but really do and practice UDL. And then it makes it that much easier or stronger for people to understand what it is. I hope that makes sense.

JACLYN LEDUC: Thank you, Luis. I also have some couple more questions. We have a little bit more time. One of the questions is, "how have you found that accessibility features improve the experience for all viewers?"

LUIS PEREZ: Oh, that's a great question. To me, that is the most exciting thing that's happened in the last 15 years is that things that used to be specialized and require a dedicated device, now they're often built into the devices that we have with us. So on my smartphone, I have really great text to speech built in.

And just today, Apple released iOS 13. And it has built-in voice control, which is something that has also been available on Windows for a while. So you can not only access the information in a variety of ways using text to speech and very robust screen readers that are just built in-- they're not something you have to pay for or acquire separately-- but you can also control your devices using your voice and using different modalities, including the keyboard or touch gestures.

So for me, I was diagnosed with a visual impairment late in life. And learning a screen reader was quite a challenge for me because there were so many keyboard shortcuts you had to learn.

But when we went to mobile and all of a sudden you can use just a few gestures to get your work done on either iOS or Android-- and I use both-- it really changed my world. It really provided that opening for me to become proficient at assistive technology in a very short amount of time. And then over time, I've become more proficient with the desktop screen

readers, as well.

But I just needed that entry point. And I think that happens for a lot of people, where they can pick it up much quicker if it's on a mobile device with a simplified interface with just a few gestures that you have to remember. So it's been really exciting.

But I would also be remiss if I didn't say that there is another side to that. And it's the fact that the specialized companies have a hard time competing in the market. And as people with disabilities, we've built really good relationships with some of those companies. And we want to see them stay around, as well. Because they do meet specific needs that people have out there. So we don't want them to disappear from the market, as well.

I think there is a place for both, where the built-in accessibility features can meet most people's needs, but we also don't want those specialized solutions to go away. I hope that makes sense, or answers your question.

JACLYN LEDUC: Thank you so much for sharing. I think that was a great answer. And do we have time for one more question?

LUIS PEREZ: Absolutely.

JACLYN LEDUC: OK, great. So the last question I think we'll ask is, what should everyone do or what's one thing that we can do on day one when implementing accessibility UDL?

LUIS PEREZ: Oh, that's a great question because there's so many things. But I'm going to prioritize one-- really is just changing your mindset. That's the first step, so looking for the barriers and asking good questions. And again, I'm going to skip back to our definition from the US Department of Education. You can use that to evaluate your curriculum here. And let me skip forward to it so that I have it on the screen here for you.

For me, whenever I look at any material, any curriculum, I need to be able to answer these three questions. Can everybody access and acquire the same information? Can they engage in the same interactions? And can they enjoy the same services?

So basically, that engagement is just as important as the practical things, like being able to read the information, being able to navigate the book. Well, is it enjoyable? So I always ask the question, accessibility for what?

So I don't want something boring. I want something that's both accessible and enjoyable. So that's important, as well.

JACLYN LEDUC: Wonderful answer. Thank you so much. And I think that's it for our Q&A session. We're just about out of time.

Thank you, everyone, for joining us today. We really hope you enjoyed this webinar. And thank you so much, Luis, for a wonderful presentation.