



NCTI 2009 Innovators Conference

Podcast Interview

Michael Russell, Associate Professor, [Educational Research, Measurement, and Evaluation Department](#), Boston College

Transcript

Thank you. I've been doing a lot of work over the last six, seven years that's been exploring uses of technology to improve assessment practices and in particular have been focusing on students with special needs. And the presentation I'm going to give today is going to focus on kind of a new way of thinking about what people call test accommodations. And basically I'm going to make the case that because of advances in digital technologies and new ways of thinking about how you present and interact with content we can pretty much eliminate the need for test accommodations by building test systems that are based on principles of universal design such that we can on the fly tailor the environment that students work in and also in some cases alter the content that's being presented to the students. And my main argument is that for a test item when we think about access, what we really mean is we want to make sure that the student understands what it is we're asking them to do to demonstrate their knowledge and understanding of a given skill or a concept. And the key then is to make sure that they have understanding of the content that they're being asked to work with, and so my presentation is going to focus on some advances, some new methods that we've been working on to increase access to test content.

[Some examples of universal design?]

Yeah, so you know, the way we think about it is every single student, whether or not they have a disability or special needs, actually have special needs; no two students are exactly the same in terms of how they're going to want to interact, view, respond to content- in this case test content. And so a testing program begins by building individual profiles, and those profiles define the preferences that students have, so that when a student goes and they begin taking a test, if a student prefers to see print in a larger font size or a larger size it's automatically adjusted to their preferred size. If they prefer to see things through colored filters because it allows them to actually view and read text more easily, that filter's automatically applied. If a student is, let's say, deaf or hearing impaired, communicates in ASL, they automatically have tools available to them that will present the text in ASL using either a sign avatar or a recorded human signer. Similarly if you read primarily using Braille, you can have a setting that will put that text out to an electronic Braille display, so that the whole notion is, and these are all different ways of presenting text, but then there's also, depending on a student's need, sometimes when they encounter an image, or in particular information that's presented in tabular form, simply decoding text- reading text in cells aloud – is not going to help a student



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who has vision impairments understand how that information in one cell relates to other pieces of information in that table, or in a graph, or in a figure. And so really what they need is a completely different description or a different representation of the information that's presented in that object. So again that becomes a part of a person's preference, is which representational form of a given piece of content they're going to be presented with. Because it's all digital, because it's all delivered on computer, it's very easy to dynamically shift and change either the environment itself or the content that's being presented to them, and so that's effectively what a universally designed test system does.

[I'm still puzzled; how can you accommodate for children with significant cognitive disabilities?]

In part, again, that's getting a step away from what I was going to talk about, but it's equally applicable. So you can, there's two ways with a computer based test that you could more accurately measure a student no matter where they stand on the abilities spectrum, whether they're very high-achieving or currently low-performing. One is you can use adaptive testing techniques, where effectively the items and the difficulty of the items presented to a person is tailored based on how they seem to be performing up to that point. And again, if a student has a cognitive disability, if that adaptive mechanism works efficiently they may be presented with some challenging items initially but relatively rapidly they should be, the items should be tailored to their current performance levels and if you have the universal design components built in, if they have other needs, those items are being presented in a manner that's going to allow them to interact. The second way that you potentially could apply universal design principles for students who are different spectrums in terms of ability or achievement levels is you could actually have items that are designed to measure certain content and their different representational forms could be tailored so that if the vocabulary item in the original form was too difficult for a given student based on their prior achievement you can actually have alternate forms of that item that have much simpler vocabulary, or may be presenting some of the information that for most students is presented in text, in pictorial form. So there's two ways of approaching this one is through traditional adaptive testing methods, or the other is to build in alternate forms or alternate representations of the content that are tailored to the ability level or achievement level of a given student.

[I'll give you another easy one, how about with autism?]

Well, I don't know if that's an easy one – but autism is, there's many different forms and it manifests itself in many different ways but again if, for example some students who are on the autism spectrum tend to communicate better in pictorial forms or representations and so again depending on what you're measuring it would be possible to have pictorial representations of sentences and that's what they're working with. Or vice versa, you may offer them a pictorial



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keyboard, if you will, that they can then use to create responses that would be translated back to a traditional text form for a reader.

[What are your concerns as testing moves into being done more and more with computers?]

We're trying to think forward about different types of innovative item types that will become available in the future that capitalize on technology. And so for example one item type that we're working on is trying to simulate students using different objects in science that they might regularly use for example a microscope. And often times in a biology class kids will go out, they'll take a water sample, they'll look at the water sample underneath the microscope, the teacher will ask them to find different things: an amoeba, a paramecium, whatever it happens to be. And if you walk into any classroom you'll see kids looking into microscopes, and when they find something they'll raise their hand and the teacher will come over and look at it. So we're thinking you can create innovative item types that basically mimic that experience; where the student is given a slide to work with, they're given a microscope, they can change magnification levels, they can change the focus so they can effectively move up and down in the layers of that slide if you will, you can allow them to move the slide around on the screen, and then when they're finished finding whatever they're asked to for that item, effectively, their answer is whatever they leave visible on the slide and we can automatically score to determine if they found the amoeba or paramecium or whatever. The question then comes up, well what about a student who has low vision? How do you make that item type accessible? And depending on how low their vision is you can have a very magnified view of that simulated microscope, so you can accommodate that in one sense, but when you get down to very low vision or a blind student it becomes very difficult to impossible to simulate that, but that also then asks the question, and in part the question may be politically incorrect, but would you expect a student who has no vision to be using a microscope to find an amoeba, right? And so the question is – again you think about universal design and learning standards – should we be requiring all students, no matter what their disability, no matter what their needs are, no matter what their interests are, no matter anything – to be held to the same standards? Or as part of universal design, in this case for assessment, should we be thinking about different standards based on different characteristics of students. And it's a very, I think it's a politically sensitive question because one of the reasons that special education has such strong advocacy now is because students used to be held to very, very different standards, or no standard at all, and so you certainly don't want to go back in terms of what your expectations are for any student, but at the same time I think you want to be realistic and hold students to expectations that are reasonable.