News and Notes
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Family Center on Technology and Disability

Computer-Based Assessments & Accommodations: Knock, Knock, Knocking on Future's Door

In this Issue...

According to comic genius Woody Allen, "Eighty percent of success is just showing up." If Allen is correct, then the ongoing integration of children with cognitive and physical disabilities into general education classrooms is perhaps 80% complete. The remaining 20%, however, may require more than students just showing up. In an era of standardized testing, success may require leveling the playing field through universally designed computer-based assessments which provide accommodations, like read aloud, signing, and magnification, that alter the way students access information but do not alter what is being measured. Thanks to legal requirements spelled out in the Individuals with Disabilities Education Act (IDEA), including the IDEA Improvement Act of 2004; parts 100 and 300 of the Code of Federal Regulations; Elementary and Secondary Education Act (ESEA), Title I (No Child Left Behind); Section 504 of the Rehabilitation Act of 1973; and the Americans with Disabilities Act (ADA) of 1990, accommodations have been generally addressed in federal legislation and, in practice, by state and local education agencies.

Computer-Based Assessments and Accommodations

are being held to the same standards as other students. One way of measuring students' achievement of these standards is through testing, including standardized and classroom-based assessments. In order to generate accurate measures of what they know and can do, many students require accommodations. Today, courtesy of rapidly morphing assistive and educational technology, accommodations are available in an accessible computerized format that provides greater accuracy in test performance.

Although states and localities have concerns about a transition to computer-based assessment and accommodations – concerns usually based on a lack of financial and human resources – universal design in testing is gaining a toehold. Discussed conceptually for many years, new universally designed assessments address these concerns by offering computerized testing with built-in accessibility and accommodation tools that can be utilized by all students, including those with cognitive and physical disabilities. Available for only a year and a half, these assessment platforms provide a glimpse of a future to which the door is already ajar.

This issue of the FCTD's News and Notes examines the expanding role of computer-based accommodations and universally designed assessment platforms.

Michael Russell, Ph.D., Speaks

Two years out of college, Mike Russell was employed by a company specializing in computer training. Recalls Dr. Russell: "I was developing computer training courses for use in the business world. About that time schools were acquiring computer technology. Some approached my employer about training their teachers. Initially, the company was trying to teach educators to perform the same tasks on the computer that were performed by business people, like creating form letters or spread sheets for accounting purposes." That approach, he says, struck him as odd and misplaced. "These were obviously not skills that teachers needed."

Sensing a more realistic and productive role for computers in an education environment, Dr. Russell returned to school to focus on educational technology. "My technology program research led me to an interest in finding ways to measure the impact of computer programs on student learning as measured by tests and to find ways to develop more effective measurement. One of the areas in which we thought we could do better was accommodations."

His desire to conduct deeper research into accommodations resulted in the 2005 formation of NimbleTools http://nimbletools.com/about.htm, a computer-based test administration system that adapts the user interface to provide students with appropriate accessibility accommodations. Tools designed to meet the needs of students are built directly into the system, helping schools avoid purchasing separate software or configuring computers so that external software can interact with the test delivery system. The NimbleTools approach, he explains, provides for accommodations in an equitable, high-quality, and controlled manner for all students.

Prior to forming Nimble, the two co-founders,

Dr. Russell and Thomas Hoffman, collaborated with the New England Compact, comprising New Hampshire, Rhode Island, Vermont and Maine, on a series of computer-based testing studies. In addition, the co-founders developed several test administration systems for other research studies which have been used to administer tests and surveys to samples ranging from 40 to 10,000 students.

Supporting our interview with Dr. Russell are resources featuring research and reports on accommodations and the potential of computer-based and universally designed testing as a boon for all students, including those with disabilities. We also feature members of our Knowledge Network. The members spotlighted this month focus on accommodations and computer-based assessments. We invite you to contact these members for further information. Please share this newsletter with other organizations, families and professionals who may benefit from it. We invite you to visit us at http://www.fctd.info. We welcome feedback, new members and all who contribute to our growing knowledge base.

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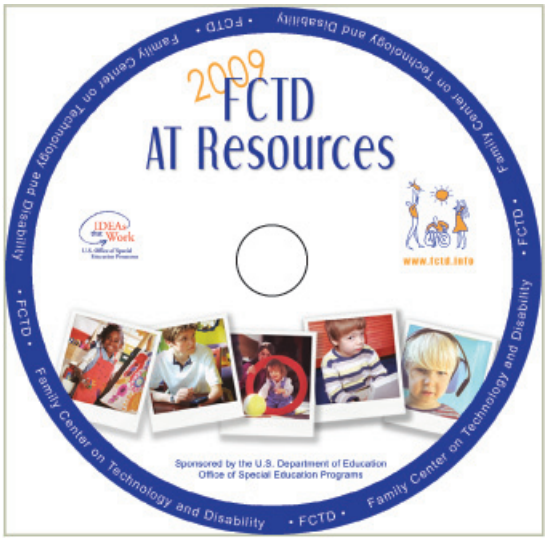

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July 20-31, 2009

This year's topics:
Use of social media tools
Digital texts: Demystifying NIMAS

Computer-Based Assessments and Accommodations: Has the Universal Design for Assessment Era Arrived?

An Interview with Michael Russell, Ph. D., president and research director, Nimble Assessment Systems; associate professor, educational research, measurement & evaluation, Boston College; director, Technology and Assessment Study Collaborative (inTASC)

Classroom accommodations for students with cognitive and physical disabilities are commonplace. Now there is a movement underway to transition classroom accommodations to assessment and testing environments using computer-based technologies. In fact, a universally designed assessment system that Dr. Michael Russell of Boston College calls NimbleTools might help to eliminate entirely the need for most accommodations.

Universal design (UD) principles have been aimed at making the general curriculum more accessible. Can these principles also be applied to test accommodations? Dr. Russell believes they can. "Universal Design for Learning is really about making content accessible for as many students as possible, which means that there has to be flexibility in the way it's presented. It's about increasing students' engagement with that content. It's about allowing students to reveal what they know and understand through multiple methods. It's about trying to match students' access needs, engagement needs and response needs with tools that present information in an accessible and engaging manner."

In an assessment, he explains, there are two components: consideration of ways students access, engage with and respond to test items; and provision of tools that will improve those three elements.

"It starts with the item writing process and thinking specifically about what an item is attempting to measure. What elements of the item are not essential in the measurement of skill and knowledge? What information can we present in alternate ways so that we can make it easier for students to access content, be engaged with it and reveal what they understand?"

Universal Design for Assessment

Educators, he says, provide accommodations when students are learning in the classroom. "By adopting a Universal Design for Assessment perspective, the accommodations typically provided in the classroom are provided by the computer for each test item. But to do so effectively, the test developer has to determine what elements of the item are essential given what is being measured and what elements may decrease engagement."

What Dr. Russell is learning, he says, "is that our focus on the presentation component – what can be viewed and presented in different ways on a computer – has created new possibilities and will force item writers to rethink a given test item. "In many cases we are trying to convert items originally designed for paper to a computer-based environment. In doing so we find that there are some items that are so poorly designed in terms of access that it is very difficult to create alternate ways of presenting them so that students with different

access needs can fully engage with the test question."

Some items contain irrelevant information in the prompts and can be rewritten. In other cases the items contain graphics that are unnecessary and/or contain irrelevant information. "Sometimes the graphic does not accurately represent what the text states. If the student is graphic-oriented she will be thinking about the item one way whereas a text-oriented student will think about it another way. The goal is to ensure that the graphic elements are aligned with the textual elements."

Eliminating the Need for Accommodations: a Lunch Buffet

Ultimately, Dr. Russell predicts, universal design principles "are going to decrease the need for what we have traditionally regarded as accommodations. By definition an accommodation is an out of the ordinary action taken to meet a specific need, whereas a universal design item in a UD system does not require any additional actions to make it accessible and engaging for a variety of students." Universal design principles, he points out, aim to allow students to make choices. "If we provide students with options as to how they access and engage with test content and then allow all students to make choices among those options, a large percentage of what we've regarded as accommodations will simply go away."

The objective "is to educate students so that they make smart choices, empowering students as opposed to putting pressure on testing programs and schools to take additional actions and incur additional costs to make an accommodation."

Dr. Russell employs the analogy of a lunch buffet to illustrate the benefits of universal design. "A universally designed lunch buffet will contain many choices to meet the needs of many individuals, whereas a non-universally designed buffet will offer only ham sandwiches on wheat bread. The tastes of many can be accommodated only by asking the server to make something special. That's what we've been doing with accommodations for many years. But if you offer the entire lunch buffet, special orders are no longer necessary."

Ten Years Ago: Heresy

Ten years ago, according to Dr. Russell, a transition of classroom accommodations to a computer-based assessment format – even one with a universal design foundation -- would have been considered heresy. "It was gospel that a student should not have an accommodation during testing or have access to a tool during testing that is different from what is used for classroom learning."

The reason for the existence of that orthodoxy, he explains, "was that many of the accommodations that are now common in a classroom context were either expensive to provide in a testing environment or involved human assistance which some felt lead to unintentional hints."

That orthodoxy is eroding fast, he points out. "With computer-based technologies widely employed and with a general recognition

among educators that assessment is different than learning, many educators are beginning to realize that there are some tools that can be available during classroom assessment and during large-scale statewide standardized tests that may be different from those used in classroom learning. In addition, some educators are also recognizing that some students who have not been identified with a need may still benefit from the accessibility tools that can be built into a computer-based test."

High Stakes Testing: 100% Accuracy Is a Must

Take, for example text-to-speech software. In a learning context, says Dr. Russell, "text-to-speech software is very effective because it can access electronic text and read it aloud to a student who has reading needs."

In a learning context, he notes, "it is probably tolerable if 1% of the time the software makes an error by mispronouncing a word, for instance, because there are other ways for a student to get support. If the student is unsure she can ask the teacher. She might be able to ask a friend. The stakes associated with students not being able to access a piece of information at that moment are pretty small."

In a testing context, however, the stakes are exponentially higher. "Having anything misread is potentially very problematic," he says. "If a student is using a specific type of text-to-speech software in the classroom because it is cheap, available and functions relatively well that is OK. But in an assessment context if that software makes an error on a critical word related to a given test item, that is not acceptable."

Continues Dr. Russell: "If there are other tools built into the testing platform that can provide 100% accuracy, even if they are not the same as those the student has been using in the classroom – the tools function similarly but may not be identical – it seems reasonable that students should use the tool that's 100% accurate as opposed to one that is 99% accurate as long as the student has had the opportunity to use the tool prior to testing."

Gaining access to the most accurate tool prior to testing is easy, he insists. "Every state has released test items. Many states have these items on computer. Therefore there is no reason why the same interface and tools should not be available for those practice items so the students can become accustomed to taking the test in that format in a practice session at home or in the classroom."

He compares this approach to the use of scan sheets by classroom teachers. "If you take this argument to the extreme, you can ask, 'How many teachers use scan sheets in their classroom? To what extent are bubbling in answers on scan sheets a part of regular classroom behavior, whether the student has disabilities, special needs or not?' They're not part of a normal classroom environment. Most teachers never have their students bubble in, except when it's time to prepare for a test. It is only in preparation for the test that teachers expose students to that type of item and testing format. Given this situation, one might argue that since bubbling in answers on scan sheets is not a part of typical classroom practices then students should not be allowed to use scan sheets during testing. The absurdity of this argument applies to well designed tools that can help

students access and engage with content during testing."

Although the importance of human involvement in accommodation administration has been sharply reduced by 10 years of technological advances, it continues to exist and remains a factor, Dr. Russell explains.

The level of human involvement depends on the needs of individual students, he notes. "Some students in an assessment context continue to require human assistance to help them navigate through a test, find materials and work with materials. Humans used to conduct read-aloud or signing of tests. A teacher would stand before the students to do read-aloud or work individually with students to read items one by one or in a group setting. The same with signing. An interpreter would sign content. Now the human can be removed from the process in a computer-based environment and we can guarantee that all students are provided high-quality, accurate reading or signing of test content."

Accommodations Policies Vary by State

Universal Design for Assessment, he predicts, may eliminate the policy differences between states and localities regarding accommodations. Even today, however, "there are certain types of accommodations that are fairly standard across states. These accommodations include reading aloud of text for students with certain disabilities and presentation of material to students who are blind or visually impaired and are Braille readers in a Braille context."

Other types of accommodations, such as the use of auditory calming tools or policies regarding the signing of items or the use of tools like pencil grips vary from state to state, he says.

Among the most common accommodations is extended time. Many students with special needs or disabilities require additional time when taking a test, sometimes because they are receiving another accommodation and sometimes because it takes longer for them to work through problems, Dr. Russell explains. Read-aloud is the second most common accommodation. "After that the numbers decrease significantly," he notes. "It depends on the content being measured. In writing tests, for instance, every state has a number of students who will use scribes to help them compose text. Every state allows Braille versions or large-print versions of tests."

Some states, however, designate many more types of accommodations, he notes. New Hampshire, for example, allows 15-25 types of accommodations with provisions to make special requests for additional accommodations. New Hampshire's accommodations even include the use of pencil grips or large pencils. When making decisions about accommodations, he says, "It is important to separate tools and strategies students use to access and record their thinking from alterations that are made to a test administration to improve access and engagement versus modifications that are made to the actual test items."

Accommodations Don't Alter What Is Measured

According to Dr. Russell, "There is an important difference between an accommodation and a modification. The common understanding in the field is that an accommodation does not alter what is being measured, it alters the way that students are accessing information or providing responses but not what is being measured or what the student is trying to learn."

Generally, he adds, "an accommodation does not change the item itself, only the way the items – the words or images – are presented."

A modification, however, is a change that does alter what is being measured, he notes. "Take, for example, a math item where the original item presents a problem as a word problem and a student then has to transfer the words into a mathematical problem and solve it. If the item was changed by removing the words so the student can focus on the computational aspect of the problem that constitutes a change in what is being measured."

Some of the work Dr. Russell and his organizations have done involving universal design and accessibility has impacted the decision-making process used to determine which modifications are appropriate. "Traditionally, for test accommodations, most states' policies focused on a student's Individual Education Plan (IEP) and whether or not a test accommodation is specified in that plan. Often those plans are based on the disability with which a student has been identified and which disability group that student is placed in."

For a given disability group, he says, "it's commonly accepted that certain types of accommodations help those students access, interact and respond to material. The traditional practice has been for an IEP team to look at a student's IEP, examine whether or not accommodations are specified for that student and, if so, make a decision about whether or not for a given test that student should have that accommodation provided to them."

Consideration Based on Need

Now, however, "we are beginning to see a movement away from an emphasis on identifying students with disabilities and then considering which accommodation might be appropriate for the disability and toward matching accommodations with students' individual needs. This seems like a subtle shift, but it is really quite important. Rather than assuming that an accommodation is needed because a student is a member of a given disability group, we are starting to see educators focus on the needs of each student, regardless of their group membership, and matching tools and strategies to their specific needs."

Some needs, he says, "arise because of disabilities that have been identified while others arise for reasons that are unrelated to an identified disability." Even within a given disability, specific needs may vary by individuals, he points out. For example, he explains, "some students may have very low vision and are Braille readers, but they have partial sight. The types of accommodations they need might consist of accessing text through Braille, or a

large magnification of graphics and images."

Other students with the same low vision may be non-Braille readers. "Their needs require very large magnification of graphic images along with read-aloud text." Still other students may be accustomed to using magnification software on their computers. "They may not need content read aloud. They may only need a tool that will greatly enlarge the text. Some of those students may also benefit from reverse contrasts." In that case, he advises, "enlarge and reverse the text so the students are able to access it."

The idea, Dr. Russell says, is not to say, 'You're a low-vision student therefore members of this disability group are going to get 'x,' but instead to meet the specific need of a student regardless of the student's disability. If that need can be met through an accommodation or an alternate way of accessing test content then the accommodation ought to be provided." According to Dr. Russell, this shift in approach, while it does not represent a major conceptual change, "is a big shift in terms of the decision-making process."

The new decision-making process starts, he says, with each student garnering a support group consisting of individuals who know that student best, including parents, a special educator, and the student's teachers, "and determining what accommodations will enable the student to most effectively access information in the classroom and what will help the student to best demonstrate her knowledge and capabilities."

School Districts, Accommodations and Testing: Three Categories of Concern

School districts share three categories of concern regarding accommodations, says Dr. Russell. The first category of concern, he explains, is student need identification. "When it comes to testing, schools are concerned about whether they have identified the needs of students."

The second category of concern, he notes, is providing appropriate tools and resources to meet the identified needs. "Even today in any context, many schools recognize that they have large numbers of students who need a read-aloud accommodation. Ideally there would be one individual working with each student to provide the reading." However, he adds, schools lack sufficient personnel to do this. "They lack enough quiet corners in the schools. The result is that there are small groups of students working with a single teacher." Schools are in some cases concerned about their ability to meet the needs of students during an assessment, Dr. Russell concludes.

The third category of concern among school districts, particularly within the context of accountability and No Child Left Behind, is in implementing solutions that will invalidate students' scores. "There is some wariness about providing assistance that might be viewed as helping students answer a question as opposed to helping them access a question. What links these three categories of concern is an overarching concern about equity and

standardization the provision of accommodations."

These concerns, he insists, can be addressed at the state testing program level by adopting policies and tools that remove the burden from schools for providing the resources needed to provide accommodations. Removing this burden, he asserts, will help standardize the provision of accommodations among schools and ensure that all schools can provide high-quality accommodations for all students. For example, "if schools can move to a computer-based delivery system that has accommodation and accessibility tools built into it then they will not have to provide human resources." Concerns about standardization and equity are removed "because when schools adopt a computer-based delivery system everyone receives high quality, no matter what resources the school has available."

Many schools have become exposed to universally designed computer-based delivery only in the past 18 months, Dr. Russell says. "There's been talk about universal design in testing for many years, but there has not been a platform that embraces those principles until very recently."

Some states, he notes, are attempting to determine how to make the transition to computer-based platforms. "Florida has conducted some pilot studies as has New Hampshire. Vermont, New Hampshire, and Rhode Island are using a computer-based platform for their 11th grade science test this year. Delaware's most recent Request for Proposal contains language that effectively requires computer-based tools." Despite a perceptible movement toward computer-based assessment it is not yet a nationwide trend, Dr. Russell says. "Most states are just now becoming aware that universally designed computer-based test delivery is an option."

Computer-Based Testing: Roadblocks Loom

The good news, according to Dr. Russell, is that there is little resistance from state testing programs to computer-based testing. "I've spoken about it to more than 30 states over the past 18 months. If there was an easy way to transition to it my guess is that every state would do so. The roadblocks are the current nationwide economic crisis and existing vendor contracts. There are some concerns about capacity of schools. But there is no philosophical resistance."

One major issue, he notes is "whether or not these tools are limited to students with disabilities, which is the more traditional way of thinking about accommodations, or should the tools be made available to anyone who might benefit from them."

In Dr. Russell's opinion, "some states will move in the direction of computer-based platforms very quickly." New Hampshire has effectively done that already, he notes. "New Hampshire has said that any student whose teachers or [counselors] believe that these tools will benefit the student during testing is eligible to use that tool without reference to his IEP. That's a huge change, a big paradigm shift. It's much

like closed-captioning. When closed-captioning was first introduced, it was assumed that only those people who are deaf or hearing-impaired would benefit. However, today we see that many people who aren't deaf or hearing-impaired make use of closed-captioning. The same will likely occur for many of the tools that are built into a universally designed test delivery system."

One of the long-term benefits of these evolving tools and systems, he points out, is that they help identify disabilities that have been camouflaged. "I've often heard, 'When we turn on the color contrast tool Johnny does a lot better.' Based on this observation, an educator may discover that Johnny has a visual need or a stimulus processing disorder that had been undetected."

Universal Design Principles in Nimble Tools

Dr. Russell and his NimbleTools co-developer Tom Hoffman have begun to incorporate universal design principles in several current projects. "We're developing a computer-based test delivery system with accessibility tools built into it. We've been working on this for 5-6 years. The project started with reading. The State of New Hampshire asked us to explore the use of computers for read-aloud accommodations. We developed a prototype for that purpose. We found that every time we used one version with a group of students, the students or their teachers end up making a suggestion about other needs that could be met."

Universal design has achieved two major objectives, he notes. "First, it forces us to continuously think about students' needs and how those needs differ among students. Second, getting this concept to work in a standardized manner in all schools and across all computer platforms, is like applying universal design principles to building architecture. In other words, we've been trying to incorporate accessibility features into the architecture of the system rather than adding on tools and features after the system has been developed."

Rather than adding on, he explains, "we always return to the underlying architecture and determine how to build a specific tool into the architecture so that it works with all the other tools that are there." Rather than layering on and finding external tools that may or may not be compatible, "we return to the basic architecture of the platform and make sure the tool is built in. Sometimes that means we have to undertake a complete redesign of the architecture."

Teachers Need Little Training, Only Time

Teachers need very little training with the computer-based testing tools provided by NimbleTools, Dr. Russell asserts, only time. "What teachers need is time to work with students, as opposed to training. For many students these tools and the flexibility to use them as needed are relatively new."

Teachers, he adds, "need to help students make informed choices about what will work well for them as opposed to what will be distracting. That means that teachers must become familiar with the tools. The design itself is universal in the sense that we want it to be

as intuitive as possible for students to use. But time is required to understand the full range of options that are built into the system."

In most cases, he continues, users can view a one-minute tutorial showing the use of the tool and then have a couple of the items with which to experiment. "In the vast majority of cases teachers will know how to use that tool. The key, though, is for teachers to have the time to work individually with students to make sure the students are making good choices."

Surprisingly, Dr. Russell's tools have so far encountered little resistance from teachers, even from veteran teachers who may have had limited prior exposure to technology-based approaches. "In all the schools we've worked with we have not encountered any resistance," he says. "In fact, what we often hear from teachers is, 'Wow, this is what we've always needed!'"

He cautions, however, that "we're not asking teachers to put content into this system yet. We're hoping next year to have a tool that will allow that. When we get to that stage we will start to see some teachers begin to require more support. Right now we're just presenting assessment tasks and items on a computer for students. The teacher only needs to be there to help students make good choices. In most cases, the student is working directly with the interface as opposed to the teacher having to prepare content for students to work with. Teachers see the system and say, 'I've always struggled with providing accommodations in a classroom but this is so easy.'"

Parents Need to Know What's Possible

Parental input regarding accommodations issue varies from school to school and by grade level, Dr. Russell says. "Younger parents tend to be more involved in these decisions than parents of older students. What parents most need to know is what is possible. Many are unaware of what is possible today. Parents can't ask for what they're unaware of."

For parents, he admits, awareness building can be challenging. "Resources for parents exist," he states, "but unless parents are directed to those resources most are probably unaware of them. I recently received a call from a parent in Massachusetts whose child was preparing to take a standardized state test. The parent said, 'I know my child has these needs. It sounds like what you've created can help her. What do I have to do to enable our child to use this tool?'" Once parents develop awareness, he says, "their next challenge is to persuade state testing programs to allow the use of some of these tools."

With state testing programs, he continues, what is most important is what is included in a state's RFP, or an invitation for proposals. "We've been trying to educate states about what's possible and then help them to understand that if they want computer-based testing and accommodations they need to request them. Asking for them doesn't mean just using the words 'universal design.' They need to be very specific about what they mean by 'universal design' and what they want a uni-

versally designed program to provide."

Fortunately, he says, the horizon is brightening. "Delaware, a couple of months ago, issued an RFP which is a perfect example of very concrete specifications. I predict that we will see more RFPs like that one."

The state testing programs are in a difficult position, he concedes. "They can't ask for something that can't be delivered. Now that states are beginning to see what is possible, my hope is that they will start asking for it specifically."

For their part, he adds, "parents and other advocates can let the states know that, yes, it is really important to be asking for this and if you ask for it you are likely to save money in the long run because it is computer-based and is a universal approach to solving challenges to providing accommodations. Pressure exerted by advocacy groups on state programs will speed general acceptance."

Technological Tools that Provide Accommodations

According to Dr. Russell, there are several existing technology-based tools that provide accommodations and the promise of more to come. "There is potential for electronic Braille displays to be used," he says. "Some of the work we've done has experimented with similar tools for low-vision students." Successful experimentation, he notes, "will increase access for blind and visually impaired students who read Braille and will decrease costs."

Integrating signing video into computer-based testing holds great promise for increasing access to content for students who communicate in sign, he predicts. "It also has the potential to increase engagement because with an avatar there is an opportunity for students to have more control over the avatar itself, over what the characteristics of the avatar look like or whether or not there is closed captioning, whether there is sound associated with the signing or not."

Computerized read-aloud text already exists, as does magnification, he acknowledges. "We've worked on developing magnification tools designed for students with different needs. Some of those are going to be common and can be used by anyone. Some of those tools you wouldn't want anyone else to use because they are designed to meet very specific needs."

For Test Accommodations, the Future May Be Past

Dr. Russell hopes that the concept of test accommodations will be replaced by universal design and the flexibility that computer-based technology affords. "As the technologies improve over time they will achieve more and more acceptance for providing access. I believe that most assessment, whether large-scale or even classroom assessments, will move to a digital format. Once in a digital format some of these accessibility tools, whether built into a platform like NimbleTools or tools that are provided by other organizations, are going to become so common that we will stop thinking about them, like closed-captioning today."

How quickly this vision takes shape is dependent on two factors, Dr. Russell says. One key is how fast states begin specifying universal

design-type systems in their RFPs. The second key is the extent to which the assessment vendors, who are putting content into the classroom and also running large-scale programs, decide that it's important to have a common interface across their product line."

If the vendors make that decision relatively quickly and can change their products, he says, the transition to a new era might occur soon. "However, he cautions, if the big publishers are slower to adopt those changes, or if states are slower to change their RFPs, it could take as long as 10 years before a transition to digital assessment is complete." However, if states and vendors work in tandem, he predicts, the transition could come within the next 3-5 years.

There's still time to join the FCTD online discussion of

AT and Transition moderated by Gayl Bowser

This forum began on April 13 and will continue through May 8

http://www.fctd.info/webboard/index.php

RESOURCES

Articles

IInclusive Design for Maximum Accessibility: a practical Approach to Universal Design
By Elizabeth I. Hanna
Pearson Educational Measurement Research Reports (2005)

This article reviews the literature related to Universal Design for Learning (UDL) and Universal Design for Assessment (UDA) and outlines an approach for combining these two philosophies in evaluating large-scale assessment programs. The article features a planning approach to UDL and UDA in assessment programs that is divided into three categories: the construct of the assessment, the use of the assessment and the accommodations provided for the assessment. The author discusses the psychometric implications of UDL and UDA, specifically those related to test scaling and comparability.
http://www.pearsoned.com/RESRPTS_FOR_POSTING/ASSESSMENT_RESEARCH/AR3.%20PEM%20Inclusive%20Design%20Accessibility%2005_04.pdf

Accommodations and Modifications: Adjusting the Classroom Experience
Great Schools, Inc. (2006)
Updated in 2006, this information sheet explains the difference between accommodation and modification in the classroom for students with special education eligibilities. The sheet defines both terms. Accommodation means that a student is allowed a different way to

access material and produce material in order to participate in the classroom. Modification means that the curriculum is adjusted, often with lowered expectations and academic standards, so that the student is exposed to the material. The sheet also gives examples of how accommodations and modifications affect students and the classroom experience. A discussion of the use of each in high stakes testing is also presented.
http://www.greatschools.net/cgi-bin/showarticle/2306

Using Systematic Item Selection Methods to Improve Universal Design of Assessments

By Christopher Johnstone, Martha Thurlow and Jason Altman
National Center on Educational Outcomes (NCEO) (2006)

In order to help states and other testers explore the use of computers for testing and judge the appropriateness of the computers and their Universal Design features, the authors and the recommend incorporating the following elements into expert review considerations:

- Conduct the review as early as possible in the stages of test development.
- Include disability, technology and language acquisition experts in item reviews.
- Provide professional development for item developers and reviewers on use of the Universal Design considerations.
- Present the items in the format in which they will appear on the test.
- Include standards being tested with the items being reviewed.
- Try out items with students (use Think Aloud methods).
- Field test items in accommodated formats.
- Review computer-based items on computers.

The authors stress the importance of having a systematic approach to reach Universal Design in assessments. Research is paving the way to identifying techniques that are workable. Any one technique by itself, however, may be insufficient, they emphasize. The methods they identify are aimed at reducing the possibility of erroneously flagging and eliminating items that reflect poor performance due to students' lack of opportunity to learn. Specifically, the authors note, using sets of considerations for expert review can make the test development process more transparent, informed and focused on the needs of the entire population of students and ensure that the assessment results are more meaningful for the widest range of students. Statistical analysis methods, they add, can help pinpoint test items that are potentially problematic and that may have universal design issues. Think-aloud methods, the authors explain, can be used with students themselves who can provide information that will help illuminate whether there are design issues that need to be addressed. http://cehd.umn.edu/NCEO/OnlinePubs/Policy18/

Universal Design for Assessment

Soapbox Digest; Institute for the Advancement of Emerging Technologies in Education (IAETE) (2006)

This article is a recap of a March 2005 IAETE-sponsored online panel discussion on Universal Design for technology-based assessment as part of the organization's ongoing Soapbox series.

Participating in this weeklong, email-based discussion were:

- Tracey Hall, Ph.D., Senior Research Scientist and Instructional Designer at the Center for Applied Special Technology (CAST)
- Nathan Sparks, Assessment Specialist at the Division of Assessment and Reporting, Virginia Department of Education
- Irene Spero, Vice President of the Consortium for School Networking (CoSN)
- Lynda Van Kuren, Communications Director for the Council for Exceptional Children (CEC).

The panelists were asked why retrofitting assessments is more common than beginning with Universal Design, what an assessment might look like when the principles of Universal Design are applied, what some of the challenges are, what kind of professional development is needed, and where the relationship between accommodations and universal design stands. Applied to assessment, the panelists agreed, Universal Design would offer all students a better opportunity to express what they know by using their preferred methods for receiving and expressing information. http://www.edvantia.org/products/pdf/SoapBox-4-1.pdf

Considerations for the Development and Review of Universally Designed Assessments: NCEO Technical Report 42

By Sandra J. Thompson • Christopher J. Johnstone • Michael E. Anderson • Nicole A. Miller

National Center on Educational Outcomes (2006)

This report describes the development of a "considerations of universally designed assessments" form based on the authors' original 2002 study. Considerations are specific questions for test designers to take into account while designing assessments. Based on the comprehensive work represented in this report, several recommendations are presented for the use of the considerations of Universal Design at all stages of test development:

1. Incorporate elements of Universal Design in the early stages of test development.
2. Include disability, technology and language acquisition experts in item reviews.
3. Provide professional development for item developers and reviewers on use of the considerations for universal design.
4. Present the items being reviewed in the format in which they will appear on the test.
5. Include standards being tested with the items being reviewed.
6. Try out items with students.
7. Field test items in accommodated formats.
8. Review computer-based items on computers.

http://cehd.umn.edu/nceo/OnlinePubs/Technical42.htm

Maximizing the Effectiveness of Online Accountability Assessments for Students with Disabilities

Appalachia Educational Library at Edvantia (2006)

By Mary Axelson

According Ms. Axelson, the online, multimedia delivery of assessment offers greater flexibility in interaction than print-based assessments. That flexibility, she claims, can enable assessments to be more closely matched with the diverse ways in which students receive, process and respond to information. Software and hardware tools can, for example, allow students to select an answer by gazing at the

screen, to change the appearance of text, or to answer an open response item by speaking. Minute neural or muscle movements, she explains, can initiate computer commands. Prompts can help students remember to use learned strategies for organizing their work or kicking their memory into gear. According to the author, technology-based assessment holds vast potential for administering tests, engaging students, diagnosing learning styles and disabilities and immediately capturing and handing back data on the effectiveness of school programs. New item types, such as editing a document, making a concept map, manipulating a simulation, or drawing a river on a map, are also emerging. Yet, as promising as online testing is, the author cautions that the experiences of some states have shown that making even the most basic conversion to online testing -- replicating a paper-based test for digital delivery, for example -- is a substantial task. Large text, for example, is not an improvement if students must scroll sideways to read it. Furthermore, she concludes, reformatting existing items for presentation on a screen and opening them to a greater number of assistive technologies creates new potential for affecting the reliability and validity of an assessment.

In 2006, the Appalachia Educational Laboratory at Edvantia and the Council of Chief State School Officers conducted interviews and panel discussions on creating online assessments of technology skills. These conversations revealed that assessment developers are finding that creating online assessments requires a different design process than creating paper-based tests. The traditional tag team approach to test development needs to be replaced by greater collaboration.

To obtain a print version of this report, contact:
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http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1b/b8/31.pdf

Guides

A State Guide to the Development of Universally Designed Assessments

By Christopher Johnstone, Jason Altman, Martha Thurlow, Michael Moore
National Center for Educational Outcomes (2006)

This guide provides states with strategies for designing tests that stress the high level of accessibility offered by Universal Design for Assessments (UDA). These strategies encompass the stages of the developmental and implementation, including conceptualization and item construction, field-testing, item reviews, statewide operationalization, and evaluation. The guide's objective is to help educators create tests that present an accurate measure of the knowledge and skills of the diverse public school population and is accompanied by an online supplement, accessible via www.nceo.info/UDmanual/.

The authors emphasize that UDA is an iterative and on-going process. To this end, they explain, multiple ongoing steps are

necessary to ensure that assessments are as valid, reliable and accessible as possible. Their recommendations are applicable to computer- and paper-based assessments. Readers are encouraged to view the online accompaniment to this report, which can be used in conjunction with this guide. See the Universal Design Online Manual.
http://cehd.umn.edu/nceo/OnlinePubs/StateGuideUD/UDmanual.pdf

http://cehd.umn.edu/nceo/UDmanual/default.html

Discussions

Beyond the Bubble: Technology and the Future of Student Assessment
Participants: Bill Tucker, chief operating officer, Education Sector; Charles Barone, Ph.D., director of federal policy, Democrats for Education Reform; Margaret Honey, president of the New York Hall of Science; Scott Marion, Ph.D., vice president, National Center for Improvement in Educational Assessment
Education Sector (March 3-5, 2009)
The participants discuss the ways technology can deepen and broaden assessment practice by measuring more comprehensively and assessing new skills and concepts.
http://www.educationsector.org/discussions/discussions_show.htm?discussion_id=826893&doc_id=843542

Books

The Paradoxes of High Stakes Testing: How They Effect Students, Their Parents, Teachers, Principals, Schools and Society
By George Madaus, Michael Russell and Jennifer Higgins
Information Age Publishing (2009)
The authors present a strategy to maximize the positive effects of educational testing. The book explores:

- How testing is used to enable teachers and schools to be more effective and improve student learning
- Why testing is so ingrained in the American psyche and why policy makers rely on testing policies to reform our educational system
- What we can learn from a long history of test-based reform efforts that have occurred over centuries and across continents
- What effects testing has on teaching and learning in our schools when it is used to solve political, social, or economic problems

The authors describe ways in which testing can be improved to provide more accurate and more useful measures of student learning. Many of these improvements capitalize on technology to provide teachers with more detailed, diagnostic information about student learning and that measure skills. The book urges closer monitoring of high-stakes educational testing to minimize possible negative effects of testing on students and schools. Cost: $19.99; 264 pages. http://books.google.com/books?id=HPHXUAGSnI0C&dq=The+Paradoxes+of+High+Stakes+Testing:+How+They+Effect+Students,+Their+Parents,+Teachers,+Principals,+Schools+and+Society&printsec=frontcover&source=bl&ots=j58L_7JTVn&sig=CLv07-DVyse4EEzMdRAcPsT8Www&hl=en&ei=OCbuSaC_IYjMM5iT-QI&sa=X&oi=book_result&ct=result&resnum=4#PPP1,M1

Free Software

Stages Curriculum Software
Assistive Technology, Inc. (2005)
Stages is a seven-level developmental framework that describes a learner's cognitive and language abilities. Stages includes an assessment process that may help teachers develop IEP goals. Stages may also be helpful in developing activities that meet alternative assessment criteria. The sequence of seven Stages is based on the work of Madalaine Pugliese, nationally recognized AT and instructional technology expert. The Seven Stages include:
(1) Cause and Effect
(2) Language Readiness
(3) Emerging Language
(4) Early Concepts
(5) Advanced Concepts
(6) Functional Learning
(7) Written Expression
Using Stages' the Curriculum Software Search tool, teachers or parents can select the most appropriate stage of development. After clicking on the selected stage, the user is presented with a checklist of items preferred in the software, including platform, access mode, type of feedback and a choice to record or not to record results. No charge.
http://stages.cambiumlearning.com:591/chartsonline.htm

KNOWLEDGE NETWORK MEMBERS

Technology & Assessment Study Collaborative (inTASC): Boston College

The organization is a not-for-profit research group that collaborates with schools, educational institutions and businesses on research and development related to technology and assessment. inTASC research projects include 1 to 1 technology initiatives, computer-based assessment and instructional technologies. Recent computer-based assessment projects have included:

- Diagnostic Geometry Assessment, an online assessment providing instant feedback for teachers to identify and assess geometric misconceptions and underdeveloped reasoning
- Task Module Assessment Systems, which developed a novel approach to assessment that decomposed complex mathematics problems into sub-components to identify student skills needed to solve complex problems
- The Enhanced Assessment Project, which conducted four studies to determine how technology can be used to increase assessment validity and access
- Talking Tactile Tablet, a test accommodation for blind and visually impaired students
- Computer Use in Writing Tests, a series of studies examining the validity of scores provided by written tests administered on paper to students accustomed to writing with a word processor

For more information on inTASC, contact:
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332 Campion Hall
Chestnut Hill, MA 02467
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http://www.bc.edu/research/intasc/

National Center for the Improvement of Educational Assessment (NCIEA)

The Center assists states and educational agencies in the design and implementation of assessment and accountability policies and programs nationwide. NCIEA services include:

- Helping states establish Technical Advisory Committees that ensure the technical soundness and legal defensibility of a state's assessment and accountability programs
- Designing state assessment and accountability systems
- Guiding states in the planning, evaluation and implementation of programs
- Research and consulting on a range of issues, including policy evaluation, formulation and analysis, issue and goal definition, data modeling, analysis and interpretation, preparation of policy papers, briefs and draft legislation, evaluation of the educational effectives of proposed systems
- Production of several pertinent publications dealing with assessment and accountability issues

Current clients include state departments of education in Louisiana, Vermont, Oregon, Pennsylvania, California, Nevada, Alaska, Wyoming, Massachusetts and Ohio.

For further information on the center, contact:
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PO Box 351
Dover, NH 03821
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http://www.nciea.org/

National Center on Educational Outcomes: University of Minnesota (NCEO)

Founded in 1990, NCEO provides national leadership in designing and building educational assessments and accountability systems that monitor educational results for all students, including those with disabilities and limited English proficiency. NCEO:

- Works with states and federal agencies to identify important education outcomes for students with disabilities
- Examines the participation of students in national and state assessments, including the use of accommodations and alternate assessments
- Evaluates national and state practices in reporting assessment information on students with disabilities
- Conducts directed research in assessment

and accountability
- NCEO focuses its efforts on the following areas:
- Needs assessments and information gathering on the performance of students with disabilities in state and national assessments and other educational reform efforts
- Dissemination and technical assistance via publications, presentations, technical aid and other networking activities
- State data collection and technical assistance to help states in collecting comprehensive, accurate, consistent data on the participation and performance of students with disabilities

NCEO resources include:
- A publications list that includes technical reports, state activity updates, policy documents and self-study guides
- Criteria for evaluating existing policies on large-scale assessments
- Recommendations for developing assessment policies and guidelines for participation, accommodations, reporting and accountability
- A national network of experts to aid states and other agencies in the consideration of assessment issues

For additional information on NCEO, contact:
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Center for the Study of Testing, Evaluation and Educational Policy (CSTEEP)

CSTEEP is an educational research organization affiliated with the Boston College School of Education. CSTEEP has conducted research on testing, evaluation and public policy, studies to improve school assessment practices and international comparative research. The organization conducts small- and large-scale research in conjunction with individual schools, districts, states and countries to advance educational testing practices and policy. CSTEEP's staff includes faculty from the BC Graduate School of Education's Educational Research, Measurement and Evaluation program. For more information on CSTEEP, contact:
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http://www.bc.edu/research/csteep/

Universal Access to Assessments

This project brings together 11 states to examine the feasibility, effect and capacity to deliver achievement tests using a computer-based test delivery system specifically designed to provide

universal access to test content for students with disabilities or special needs. The project utilizes a test delivery system that employs principles of universal design to flexibly meet the accessibility and accommodation needs of individual students. State participants are New Hampshire, Vermont, Rhode Island, South Carolina, North Carolina, Georgia, Montana, Iowa, Connecticut, Maryland and Florida. http://www.nimbletools.com/necap/index.htm

Edvantia

Edvantia is a non-profit educational research and development corporation that provides research, evaluation, professional development and technical assistance to school districts, states, the federal government and commercial vendors. Most of the organization's efforts focus on rural school districts. Current Edvantia projects include:

- Family Connections, a series of early learning guides that aid parents in their support of at-home learning
- Quality Questioning: Research-Based Practice to Engage Every Learner, a book published in 2005 by Corwin Press that provides classroom strategies aimed at addressing the achievement gap to teachers
- ePD Edvantia, which provides online professional development services to teachers in remote, rural areas
- The Coalfield Rural Systemic Initiative, managed by Edvantia and funded by the National Science Foundation, a collaboration of 18 rural school districts, several colleges and the state departments of education in Virginia and West Virginia to improve the teaching of math and science as well as student skills in those disciplines.

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