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Video
FULL DETAILS AND TRANSCRIPT

Universal Screening in Math

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Topic: Response to Intervention in Elementary-Middle Math
Practice: Screening and Monitoring

Highlights

- Why universal screening is critical for decision making
- Key mathematics concepts for screening at different grades
- Technical criteria for selecting instruments: predictive validity, reliability, efficiency
- Sources of screening measures
- Purpose of cut scores
- Sensitivity and specificity of cut scores
- Making adjustments to cut scores

About the Interviewee

Dr. Anne Foegen is an associate professor of curriculum and instruction (special education) at Iowa State University. Dr. Foegen has over 20 years of experience working in the area of mathematics with students with learning disabilities and behavior disorders as a teacher and researcher. She served as principal investigator on Project AAIMS, a federally funded initiative to develop and validate a set of algebra progress monitoring measures. She is the lead researcher for mathematics for the Research Institute on Progress Monitoring, directing a subcontract awarded

by the University of Minnesota. Dr. Foegen serves as a consultant to the Center on Instruction: Mathematics (Russell Gersten, PI), developing training materials and providing technical assistance related to progress monitoring in mathematics. She was an invited reviewer for the National Mathematics Advisory Panel's report *Foundations for Success.* Dr. Foegen is one of a handful of special education researchers examining the development of progress monitoring tools for secondary mathematics; her research has been presented at national conferences and published in prestigious special education journals.

Full Transcript

My name is Anne Foegen. I am an associate professor in the Department of Curriculum and Instruction at Iowa State University. As schools are adopting Response to Intervention as a way of better meeting all students' needs, universal screening is a critical foundation in that program. Within Response to Intervention, having data on all of your students is important as teachers make decisions about students moving between the different tiers in an RtI system.

By gathering screening data on all of their students, schools get objective information about students, and that's one difference from just relying on teacher recommendations. There is research that demonstrates that the screening measures that are used predict later performance on achievement outcomes. So by using these measures, instead of teacher recommendations, schools can be more confident that the data that they are getting will help them make good decisions about which students might need more support in order to be successful.

At the primary grades, the concepts that are most important in the math curriculum revolve around number concepts and helping students develop number sense. Some examples of types of measures that might be used at the primary grades include things like strategic counting and whether or not students can identify which of two numbers is the larger number. That's an important concept that builds toward later skills.

In the middle grades, from fourth grade through eighth grade, the whole number concepts are important, but in addition, rational numbers become especially important, and in particular, knowledge related to fractions. The National Mathematics Advisory Panel, in its 2008 report, strongly recommended that students become proficient in their knowledge of fractions so that they are prepared to be successful as they study algebra later. Examples of the types of measures that are used in the middle grades would include more comprehensive types of measures. Some deal with computation and the kinds of computational skills, in whole numbers and rational numbers, and other measures typically involve concepts and applications, so they would include a wider range of skills from the curriculum.

When schools are looking for math screening instruments, they should consider three factors. The first is predictive validity. When a measure has predictive validity, teachers can be confident that students' scores on those measures will predict how they are likely to perform on later outcomes like state achievement

tests.

A second factor to consider is reliability. When a measure is reliable, teachers can be confident that the scores that students get on the day of the assessment or on a particular form of the assessment would be the same if it were given on a different day or using a different form.

The final factor that teachers should consider is efficiency. Measures should be brief so that they do not take too much classroom time, and when predictive validity and reliability are equal, teachers should choose the most efficient of the measures so that the screening process can be completed in the shortest amount of time.

When schools are looking for measures, the best places to look would be to start with the assessment staff within a district. Another source that is often helpful to educators is the National Center on Response to Intervention's website [www.rti4success.org]. This center provides a technical review of tools and makes available information about a variety of products for educators so that they can make more informed decisions about their measures.

Setting Cut Scores

A cut score is a threshold that's set on a screening measure to help educators make decisions so that students who fall below a cut score are those about whom teachers should have the most concern and want to consider providing additional instruction to. Some commercial measures provide cut scores, but even when they're provided it's important that districts take a close look at whether those cut scores are appropriate for their population.

Some of the concepts related to cut scores that are important include sensitivity and specificity. Sensitivity deals with the degree to which that cut score helps teachers find the kids who truly are at risk. Specificity has to do with whether or not the measure is accurate in identifying students who are not at risk. As districts work with cut scores, what they want to do is to try to maximize both sensitivity and specificity so that the screening data is giving them the best possible information about which students do need interventions in order to be successful and which students do not require additional supports. This often is going to require tinkering with that cut score and making adjustments, so it's important not to just set a cut score and never revisit it. Schools may want to take advantage of this revisiting process every few years, or especially if they have changes in their standards, and go back and look at their data and determine whether the cut-points need to be adjusted.