Uncovering Exactly What Each Student Knows and is Ready to Learn Next

Executive Summary

Today, sophisticated, modern assessment systems are available that bring complete visibility into individual student knowledge and readiness — using assessment to understand precisely what each student knows, does not know, and is ready to learn next. This powerful knowledge informs instruction and creates targeted personalized learning experiences that boost student growth and achievement.

The right assessment system can work in any size classroom, school or district. Importantly, it will not add to the teacher's workload. Rather, it helps lighten the load by placing students at the center of their own learning experiences.

This paper reviews five critical components that every school district should consider when evaluating assessment systems. They include the following:

1. Research-based, standards-based assessment
2. Adaptive and fixed-format assessment
3. Balanced assessment capabilities
4. Meaningful insights via reports
5. Targeted instructional resources

Introduction

Imagine any size classroom in which the teacher is acutely and continually aware of what each individual student knows and is ready to learn next. Students would be able to learn at a pace that is appropriate to them, while teachers would have an opportunity to be continually prepared for what's needed next in the classroom — getting to know each student better with each passing day.

It's an ideal scenario that may seem impossible — yet it is possible, thanks to technology.

Today, sophisticated assessment systems are available that bring complete visibility into individual student knowledge and readiness — using assessment to understand precisely what each student knows, does not know, and is ready to learn next. This powerful knowledge informs instruction and creates personalized learning experiences that boost student growth and achievement.

Best of all, the right assessment system can work in any size classroom, without adding to the instructor's workload. In fact, the right system can actually lighten the teaching load by placing students at the center of their own learning experiences.

Of course, successfully utilizing an assessment system to uncover exactly what each student knows and is ready to learn next — and then delivering the appropriate targeted instruction — is dependent on choosing the right system. This brief outlines the most important characteristics to look for in an assessment system.

> *Research has shown that using data in instructional decisions can lead to improved student performance.*[1]

> *"Most of our testing is multiple choice tests, pick one answer out of five, which is something you will never do in applying knowledge in the real world. Our assessments need to evolve to reflect the skills and knowledge that we actually value and that we need schools to teach and our students to learn… We know students learn effectively when we're clear about what the goals are."*[2]
>
> Linda Darling-Hammond
> Professor of Education Emeritus at Stanford University

Research-Based Assessment

Perhaps the most important aspect of any assessment system is the level of assessment quality it delivers. Research-based assessments have three key characteristics in common:

1. They are standards-based   2. They are data-driven   3. They provide valid and reliable results

Since the first two are self-explanatory, the third concept will be explored further. Understanding whether or not an assessment provides valid and reliable results can be somewhat less obvious and more difficult to determine.

Thoughtful assessment blueprints and items are the foundation for a research-based, valid assessment. The higher the item quality, the more reliable the test results will be — which leads to increased confidence about each student's true knowledge and understanding of the material.

Item formats need to go beyond the standard true/false and multiple choice in order to deliver a rich, interactive assessment experience for the student. Evidence-based selected response, text-dependent analysis, short answer, gridded response and technology-enabled items should be formats included in the item banks and/or assessments that are part of any assessment system you are considering.

Ensuring Assessment Reliability

Assessments are:

85% to 95%
reliable if created with an assessment organization

35% to 50%
reliable if created by a lone individual

The Importance of Test Authorship

Another point to consider is test authorship. Most schools and districts want an assessment system that provides authorship flexibility so that teachers can choose to use a prewritten test, author their own test, or customize an existing one with their own items or items from an item bank.

An interesting note regarding authorship: Research shows that, on average, the reliability of tests generated by an assessment company is significantly higher than those created by teachers alone (.85-.95 compared to .35-.50).

Many states are incorporating performance-based assessments into their standardized tests or adding assessment vehicles such as student portfolios and presentations as additional measures of student understanding. These rigorous, multiple forms of assessment require students to apply what they're learning to real world tasks.[3]

Fixed vs. Adaptive Assessment

Assessment systems should also be flexible enough to provide teachers with a choice between fixed and computer-adaptive test formats. Each has unique advantages and disadvantages. If and how each format is utilized is completely dependent upon the overall assessment goals.

Fixed Format

Most students and parents are familiar with the traditional fixed-form tests. They contain the same set of fixed questions for every student. With an assessment system, fixed-format assessments can be given online or in printed form. Results provide the teacher with a bird's-eye view of each student's knowledge relative to state standards and class peers. However, they do not provide great detail about an individual student's true knowledge. With predetermined performance cutoff points, it simply is not possible for a fixed-form test to deliver detailed insights into what each student knows, does not know, and is ready to learn next.

Adaptive Format

This is where adaptive assessment comes in. This method of testing actively adapts to each student's level of ability during a computer-based assessment. It uses a complex algorithm to adjust future questions based on how the student performed on past questions — either increasing or decreasing the level of difficulty as needed.

The primary benefit of adaptive assessment is its ability to provide a highly-detailed view of individual student knowledge. Compared to fixed-form testing, adaptive assessment can more accurately measure achievement. In addition, it can do it more efficiently, requiring a fewer number of items to accurately measure results.

Research indicates that students who receive formative assessment perform better on a variety of achievement indicators than their peers.[5]

Adaptive assessments are especially beneficial for the highest- and lowest-performing students whose actual knowledge cannot be captured through fixed-format testing because it may be outside of preset cutoffs. Keep in mind, however, that because adaptive assessment focuses specifically on the individual student, it may not necessarily provide the data needed for comparative analysis.

Studies show that adaptive learning technology can help students:[4]

Achieve results in less time

Raise their scores

Improve retention

Important Notes for Administrators

Districts interested in adaptive assessment should be aware of two important points. First, only systems that are standards-based for both fixed and adaptive assessment should be considered. The majority of systems that offer adaptive technology are not yet standards-based — but there are exceptions.

Second, the quality of assessment systems that offer adaptive testing varies widely. The most progressive adaptive engine on the market today triangulates the data during assessment to ensure that the "right" next question is always asked — providing precise measures of each student's true knowledge and readiness.

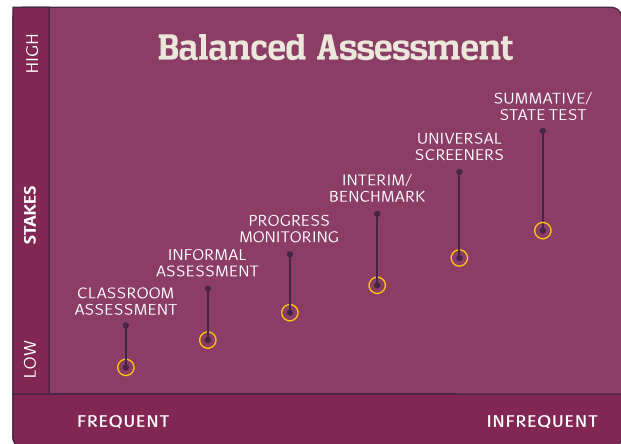| Assessment Formats		
	Fixed	**Adaptive**
Strengths	• Provides high-level view of student knowledge • Facilitates comparative analysis • Provides class, school, or district wide comparable performance on tested standards	• Provides detailed view of student knowledge and readiness • Requires fewer number of items to measure achievement • Measures performance results beyond typical cutoff points
Weaknesses	• Difficult to accurately measure highest and lowest performing students • Results are not detailed enough to show exactly what each student knows and does not know	• Does not provide a broad view of class performance • Difficult to do comparative analysis

Balanced Assessment

The assessment system you choose should support data-driven, balanced assessment. In other words, it should be part of an assessment ecosystem that uses formative and summative assessment to produce data to monitor performance and inform constructive action.

For example, at the teacher and student levels, assessment data can be used to inform instruction and create a personalized learning experience. At the principal and administrator levels, the data can be used to inform decision-making about students, resources, curricula, policy and more.

Summative tests alone cannot provide the data needed at any of these levels. Formative assessments play a major role in supplying information that guides informed action day-to-day. In a balanced assessment system, formative and summative assessment work together to provide a comprehensive view of student knowledge and performance.

The figure in the top right illustrates the concept of balanced assessment. Formative assessments occur frequently and the stakes are relatively low. These include a wide variety of assessment types — from a brief quiz or chapter test to a class game or independent project, just to name a few. Regardless of format, their primary purpose is to uncover student readiness and inform instruction.

Balanced Assessment

STAKES — HIGH / LOW

SUMMATIVE/ STATE TEST

UNIVERSAL SCREENERS

INTERIM/ BENCHMARK

PROGRESS MONITORING

INFORMAL ASSESSMENT

CLASSROOM ASSESSMENT

FREQUENT — INFREQUENT

Interim/benchmark assessments and universal screeners are also considered formative, but they bridge the gap between lower-stakes formative and high-stakes summative assessments. These formal, research-based tests must be detailed enough to inform instruction yet broad enough to provide achievement information at a macro level as well. They are typically used to assess student knowledge relative to predefined goals and indicate the breadth and depth of curricula covered at a given point in time. Additionally, they can help confirm a student's need for intervention.

Summative assessments occur least frequently and carry the highest stakes. Results of these affect all stakeholders in some way.

Without balanced assessment supported by a data-driven assessment system, the view of each student is incomplete — making it difficult to know and properly serve individual learning needs.

Meaningful Insights

Assessment systems collect massive amounts of performance data every time they are used. Turning this data into meaningful insights and informing next steps can occur in real-time (as with adaptive assessment and online guided practice) or within minutes of assessment, via on-demand reports.

Reports are very helpful for informing instruction, but they have other uses as well. For example, teachers can use them to determine how individual students are progressing relative to their personal learning goals within state standards. Or they can be utilized to detect patterns in individual, class or grade level performance. Reports are also an effective way to share factual information with stakeholders, including fellow teachers, administrators, counselors, parents and students.

For administrators, being able to run reports at the student, class, grade, school and district levels provides layers of valuable information that informs decision-making. Reports can reveal current student progress toward state standards, predict future achievement, and uncover academic areas where more resources may be needed. They can also be used to evaluate curricula by comparing grade to grade level, year-over-year.

> *When it comes to improving instruction and learning, it's not the quantity of the data that counts, but how the information is used.*[6]

One School's Story

Name
Robinson Intermediate School

Location
Aurora, Missouri

Missouri

★

Teachers at Robinson Intermediate School in Aurora, Missouri are fans of the easy-to-read, easy-to-use reports available from their assessment system. Many use individualized reports to engage students in their own learning, allowing them to set personal learning goals and monitor their own progress. Dr. Shawn Page, principal and long-time assessment system advocate, has seen a very positive response from students. He likes how this practice prepares them for the job world, where they will be expected to set goals and own their performance. It is difficult to argue with the results. The school's performance on the state's summative assessment (MAP) has shown marked improvement year-over-year since employing the assessment system.

MAP English Language Arts Percent Proficient to Advanced

2014:	2015:	2016:
37%	**60%**	**67%**

Targeted Instructional Resources

Once meaningful insights have been gathered from the assessment data, educators are able to gain visibility into what each individual student knows, does not know, and is ready to learn next. At this point, targeted instruction must be provided to successfully close the learning cycle. This, of course, requires instructional resources.

An effective assessment system must offer a multitude of research-based, standards-based digital and hard-copy instructional resources that round out the personalized learning experience. These include, but are not limited to:

- Text Books (online/hard-copy)
- Leveled Readers
- Read-Alouds
- Workbooks/Worksheets
- Interactive Digital Reading
- Guided Practice
- Tutorials
- Games
- Videos

The system should also offer comprehensive resources for teachers, such as:

- Teacher's Edition Text Books & Workbooks
- Lesson Planning Guides
- Customizable Lesson Presentations
- Digital Teacher Center

86% of teachers are constantly looking for ways to engage students based on who they are.[8]

Finally, when evaluating an assessment system, note whether it was developed by an educational content company or a stand-alone technology company. Technology companies by nature tend to be more focused on the technology itself. For them, instructional resources may be an afterthought. By contrast, educational content companies are experienced in developing instructional content that improves the learning and teaching experiences. For them, it is important to offer top-notch instructional resources that will allow users to optimize their experience with the assessment system.

Computer literacy can impact test anxiety and performance. This should be kept in mind when comparing results from computer-based and paper-and-pencil assessments[7] —both of which are available from many assessment systems.

Conclusion

With the right assessment system in the classroom, it is possible to uncover precisely what each individual student knows, does not know, and is ready to learn next regardless of the size of the class. Armed with this valuable information, teachers can use the system to deliver targeted instruction that addresses each student's unique learning needs, close learning gaps and boost student growth and achievement.

Importantly, the right assessment system will not add work for teachers. Rather, it will help lighten their load by placing students at the center of their own learning experiences.

To increase the success that your school (or school district) may derive from an assessment system, look for a solution that offers the following features:

- Research-based, standards-based assessment
- Adaptive and/or fixed-format assessment (based on your district's assessment goals)
- Balanced assessment capabilities
- Meaningful insights via reports
- Targeted instructional resources

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Citations

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