

Max Yield Data: Integrating Assessment Technology for a Comprehensive Solution



Executive Summary

National plans for educational technology have highlighted the need for an integrated assessment system. Disparate educational assessment tools cannot offer both formative and summative assessment data in an efficient, flexible way that maximizes the data yielded from student testing. Only a comprehensive, integrated solution with both diagnostic and benchmark/classroom testing components can empower educators at the district, school, and classroom levels to truly make data-driven instructional decisions.

As e-learning and assessment technology becomes more prevalent in schools, there are a growing number of available assessment tools. From computer adaptive formative testing to open content testing platforms, different types of testing solutions abound. Each different tool requires a learning curve to master the technology, human resources to manage the system, and the comparison of data from different system. With this increase in types of testing technologies, there is a pressing need for coherent systems of assessment that have both summative and formative components (Pellegrino, Chudowsky, & Glaser, 2001). As the science of computer based assessment design emerges, it is imperative that schools have a single assessment solution that not only indicates achievement level, but also offers proficiency inferences with clear instructional implications (Bennett, 2002). A single, coherent assessment technology framework that can serve all testing and assessment needs helps ensure that assessment keeps pace with the fast pace of school improvement.

The U.S. Department of Education *National Education Technology Plan* proposes that a move “to the use of multimedia or online information (digital content) offers many advantages, including cost savings, increased efficiency, improved accessibility, and enhancing learning opportunities in a format that engages today’s web-savvy students” (NETP, 2005). The Scantron Corporation, who participated in the development of the *National Education Technology Plan* (NETP, Appendix B, 2005), has integrated its two flagship assessment products, Achievement SeriesSM and Performance SeriesSM, to comply with the recommendations of the plan and to provide assessments of both achievement levels and proficiency. It is the first and only comprehensive assessment solution for states, districts, and schools in the U.S. that allows testing flexibility, the maximum possible yield of data, and comprehensive accountability. This paper highlights the disadvantages of using disconnected assessment tools, describes the benefits of an integrated solution, and describes the trends in the increasing need for educators to be able to maximize data through a single assessment infrastructure that allows for streamlined data management, maintenance, and reporting for all types of district and school testing.

The Disadvantages of Using Disconnected, Single Dimensional Assessment Tools

In an effort to meet the increasing demands for student accountability, many districts and schools have accumulated too many forms of assessment that are disconnected, impossible to manage cohesively, and difficult to maintain. Administrative data, which must be swapped between so many different tools, often becomes less and less pure, and the struggle to keep so many different products up to date becomes overwhelming and time consuming. With disparate forms of assessment, schools must cope with learning, using, and maintaining multiple, independent products. The struggles in learning and maintaining disjointed systems leads to a high turnover in product use, and schools often struggle to create long-term plans with so many different unrelated tools.

On the other end of the spectrum, many districts/schools are limited to a single assessment tool, and only use only a single dimensional type of educational technology solution that is insufficient in providing data that can provide both proficiency information and achievement data on curriculum aligned, standards based assessments. Some schools only use curriculum-based, single-subject assessments as their single form of computer based assessment, and find that there is no way to assess student proficiency and progress on a single scale and across all areas of the curriculum. Other schools have diagnostic tools, but lack any curriculum-aligned assessment tool, and find that there is no way to deliver pre-tests and post-tests to measure student achievement of the curriculum content.

The Benefits of an Integrated Assessment Solution

“Integrated, interoperable data systems are the key to better allocation of resources, greater management efficiency, and online and technology-based assessments of student performance that empower educators to transform teaching and personalize instruction” (NETP, 2005). By integrating assessment tools, educators are able to manage the testing process more efficiently while maintaining flexibility in the delivery of different types of assessments. They are also able to use a single tool for comprehensive accountability rather than trying to make sense of scattered results from multiple, disconnected tools that lack the breadth of a comprehensive solution.

Efficient and Flexible Test Management

In order to enhance the positive impact of assessment, it is necessary to use various types of assessments, with multiple indicators, to measure student performance (Linn, 1998). With a wide array of goals and desired outcomes for assessments and an even wider array of content and delivery methods, large-scale test management of every level of testing is a challenge. Most districts using traditional district and school testing processes find that the process and data are poorly and inefficiently managed leading to the delivery of assessments that are disjointed, lack collective reporting features, are plagued by testing redundancies, and are not able to truly impact data-driven instructional decisions.

An integrated solution provides testing flexibility without compromising the organization of testing schedules and processes. By providing a single application that can be used to deliver and score formative assessments (assessment that generate results that can be used by teachers, parents, and students to formulate specific assessment-linked instructional goals) and summative assessments (assessment that generates coded results that are used to evaluate student ability at the conclusion of instruction usually for grading/promotion), states, districts, and schools are able to maximize yield data by using the integration of Achievement SeriesSM and Performance SeriesSM to:

- view integrated formal, diagnostic assessment results with formative and summative district and classroom assessments
- evaluate the alignment of instructional materials by measuring student progress on achieving state standard-based goals as it compares with student achievement on curriculum-based assessments
- report all formative and summative assessment data with standard definitions and both norm-referenced and criterion-referenced interpretations
- predict the performance of students on standardized state assessments based on student performance on historical, disaggregated data from both formal computer adaptive and fixed form assessments
- deliver assessments with both content and context alignment to the curriculum
- monitor student testing to ensure that every student is assessed on every appropriate measure, at the classroom and the district level
- access valid and reliable assessment item banks and/or create new item banks for a district-wide collection
- evaluate the statistical validity of district/school-created assessments by conducting correlation studies with a valid and reliable assessment

Comprehensive Accountability

District and school administrators seek data that they can use to predict student performance on state assessments, identify school-wide and district-wide areas of weakness that need to be addressed with additional resources, and to produce reports for state and national accountability requirements. Teachers, on the other hand, tend to focus on individual student performance and seek assessment data that can be used formatively in the classroom. It is essential that administrators and teachers have a single, common testing tool that can provide comprehensive accountability to meet all educational assessment goals. Educational institutions that analyze their data collectively can better manage their resources and, as a result, increase student performance. Only a total assessment solution, like the

integration of Performance SeriesSM and Achievement SeriesSM, is able to answer a comprehensive range of accountability questions, including:

- “How has each student and class performed, by state standard/indicator?”
- “How have schools within the district performed on formative assessments compared with one another?”
- “How does an individual student compare with other students in his/her class, grade level, school, district, and across the nation?”
- “How should learning goals and objectives be prioritized, based on assessment data, for individual students, classes, and schools?”
- “How have sub-groups of students performed and how should resources be allocated based on longitudinal, test-based evidence of student achievement in those sub-groups?”

Maximum Yield Assessment Data

When assessment in a district or school is disconnected or insufficient, it is impossible to achieve *Max Yield Data*, or data that everyone involved --from administrators to students—agrees are worth the effort. The U.S. Department of Education Secretary’s *No Child Left Behind Leadership Summit* presented five basic technology-based principles/performance standards for achieving the *Max Yield Data* supportive of successful assessment and accountability systems: “Get the right data; Get the data right; Get the data right away; Get the data the right way; Get the right data management” (Ligon, 2005).

Getting the right data

In order to get the right data, an integrated accountability system must include assessments that are valid, reliable, and can be appropriately interpreted. Data must be reported with the same definitions for data elements to ensure that the data is comparable, which is why a single solution for all testing and assessment is so crucial. It helps districts and schools avoid the risk of passing nonstandard data through information systems. They must also provide detailed item analysis that allows for continuous monitoring and evaluation of the reliability and validity of teacher-created assessments. One of the goals in the *National Education Technology Plan* is to improve teacher training by ensuring that “every teacher knows how to use data to personalize instruction. . . . marked by ability to interpret data to understand student progress and challenges, drive daily decisions and design instructional interventions to customize instruction for every student’s unique needs” (NETP, 2005). In line with this national goal and to help ensure that educators get the right data, Scantron provides extensive online and on-site training on data interpretation for high-level analysis and classroom applications.

Getting the data right

An electronic solution, like the integration of Performance SeriesSM and Achievement SeriesSM, provides a highly secure, streamlined, accurate method of all delivering assessments and accessing data and reports. Data quality includes, but must also go beyond accuracy. The initial point for assessing data quality is the entry point for data, which, in an automated process using online testing or scanners, is more reliable than hand-scoring. Once the data is captured, data quality is further at risk when data is disaggregated, filtered, or sorted for comparison if the process for doing so is not automated in an integrated framework. Quality in disaggregation relies on the fact that the discriminating factors are consistent throughout every assessment, which means that every assessment must be delivered in a single, integrated solution. The ability to disaggregate all assessment data from a single database with consistent demographic information, standard time frames, and common performance standards allows for statistically reliable comparisons of data. An integrated assessment solution significantly increases the

accuracy level in the exchange of data and reduces the cycle time for assessments. Data quality also requires that data be accurate, without violating the confidentiality of examinees.

Getting the data right away

Delayed reporting and late reporting have been one of the biggest hurdles in delivering assessment yield data that all stakeholders value. Through an integrated assessment solution, all assessments—whether district level or classroom level—can be scored and available immediately. As the immediacy and efficiency of assessment procedures increases, decision-makers will have access to up-to-the-minute reports of student performance for the entire district. This maximizes the yield-data by providing immediate access to data for all levels of analysis. The cycle time for assessments must decrease in order for data to be current and timely. Linear and sequential test cycles (test everyone, then score all of the tests, then analyze the results, then publish reports) are being replaced by assessments that can be delivered, scored, analyzed, and published simultaneously through electronic systems. A major focus is on replacing data dissemination with total data access—making results available on demand, to all educational stakeholders, rather than withholding data until it is too outdated to be relevant (Ligon, 2005).

Teachers, students, and parents need immediate information that can be used to make responsive changes in teaching and learning, evaluate student progress, and make decisions about academic promotion. Teachers need to consider how their classroom activities, assignments, and tests support learning goals, then use the information to improve teaching and learning. Research shows that individual formative assessment data improves student achievement and raises academic standards in the classroom. Efforts to strengthen formative assessment produce significant learning gains, and help low-achieving students, including students with disabilities, even more than other students (Black and William, 1998). Feedback from formative assessment helps learners become aware of gaps that exist between their desired goals and their current knowledge/skills. With the increased attention in applying the standards of *No Child Left Behind* to Secondary School Reform, it is important to note that feedback from formative assessments counteracts the secondary school cycle in which students attribute poor performance to lack of ability, and therefore become discouraged and unwilling to continue to invest in learning (Vispoel & Austin, 1995).

Getting the data the right way

The right way to get data is electronically. The use of automated reporting verifies data quality and ensures that certain standards are met before the data is incorporated into the school/district information system. In the Performance SeriesSM/Achievement SeriesSM platform, administrative users at a top level (for instance, a district) can view all of the aggregated formative and summative data for the whole district—by grade level, by course, by sub-group, or by school. District users can also “drill down” to a lower level, such as a school, and view the data in the school by grade level, by sub-group, by courses, by classes, by staff member, and by individual students. Teachers can view student profiles, class profiles, individual student scores, mean class scores, and can view how their students’ scores compare with the mean scores of the school or district, as a whole.

Getting the right data management

Efficient data management includes streamlining administrative activities with reduced infrastructure demands and increased data exchange capabilities and interoperability with other database applications. With an integrated platform, single sign-on to the two applications is possible, which means that site administration is streamlined for both staff and student users. With a single user interface, administrative management is cut in half; data from student/school information systems can be imported into a single assessment database for use at the district, school, and classroom level. This streamlining reduces the amount of time/energy resources needed to manage assessment data. Several imbedded data management features are available through Scantron’s products, such as the storage of basic student information and course/class

schedules, teacher-class assignments, and classroom/district assessment gradebooks. With one solution for all assessments, exports of all district, school, or student assessment data, at any level of specificity, can be completed from a single database. Scantron provides training to the Location Controller(s) for district and/or school sites, guiding the district in top-level decisions regarding assessment data management, the exchange of data between Scantron's database and other databases. Since Scantron's total assessment solution provides all assessment through two integrated systems that are web-based, the demands on a school or district's infrastructure are minimized due to centralization. Unlike other types of computer-based assessment systems that are not web based and require constant updates, all of the web clients of Performance SeriesSM and Achievement SeriesSM have access to a centralized server that is maintained, secured, and backed up regularly. To further enhance efficient and interoperability, Scantron also partners with other educational technology system providers, so that Performance SeriesSM and Achievement SeriesSM solutions are available as integrated components of student information systems and data warehouse solutions.

Conclusion

Teachers desperately want educational technology to become the bridge that spans the chasm between where students are starting from and where they need to be. Educational technology must move toward assessment that "gives meaningful information about each student, guides day-to-day instructional decision-making, and also serves as a learning process for the students. . . [which] will help reclaim assessment as part of a process of evidence-based instructional decision-making and student-learning" (Miller, 2004). Through the integration of their assessment tools, Scantron bridges the gap between diagnostic and achievement testing, and allows educators to gather maximum yield data through an efficient, flexible, and comprehensive solution.

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