

Connecting People and Information to Improve Student Achievement

By Dr. Delia R. Duffey

We live in a connected world. While this is a cliché today, it was a revelation in 1979 when James Burke's *Connections* appeared on public television. It was an odd choice for a title in that 1979 was a comparatively "unconnected" age. The personal computer had been introduced several years earlier and names like Commodore PET and TRS-80 were populating science magazines. An information age was on the threshold. *Connections* offered a context and direction to the changes taking place around us. We now live in the world Burke predicted.

Burke's idea states that when people, things or ideas come together in new ways, the rules of arithmetic are changed so that one plus one equals three. This is the fundamental mechanism of innovation. The result is always more than the sum of its parts. Every time there is an improvement in technology in which ideas and people come together, a major change ensues. The opportunity for the educational community to take advantage of this ensuing change now exists.

Over the 30 or so years since technology related to students has been introduced into schools, the focus has been on managing student information on the administrative side and providing supplemental instruction to students. As technology has become more sophisticated and ubiquitous in schools, its use has spread throughout all facets of education. An early use of technology — student information systems — has become more common and highly robust in its power. The use of technology around instruction has changed dramatically with students using the Internet for research, making presentations using technology, etc.

As standards-based instruction and the focus on accountability have grown over the last decade, technology's role has grown in importance. Research surrounding high-performing schools shows that there are four important uses of tech-

nology in these schools:

1. A student information system to store and manage data connected to students.
2. An instructional management system to assist teachers with record keeping, such as attendance and gradebooks, as well as manage resources for instruction.
3. A student assessment program with test creation and reporting capabilities.
4. A data management/data analysis tool to help teachers and administrators use data coming from disparate assessments.

The final two components are relatively new, but critically important as schools try to fully understand what students know and are able to do during the school year.

In most districts, however, none of the four functions are connected to each other. In other words, the attendance "does not talk" to the gradebook nor does it talk to tests. These typically are isolated experiences and neither the experiences nor the data produced by them are connected to each other. One result of this lack of connectivity is that data must be re-entered into systems, sometimes daily. This takes the time of the clerk in a district office, a teacher and/or a guidance counselor. It also offers the opportunity to introduce errors either through typographical mistakes or different naming conventions. For example, Deborah, when enrolling, becomes Debbie in the classroom; Jim E. Smith becomes Jimmy Smith. In addition, important data such as past attendance could provide valuable information to a teacher about specific students.

An important, yet subtle, factor about technology as it has been used more in schools is its impact on the vision of a school district. Most districts have one or more components of the four noted above. When the educators in those high-

performing schools see all the parts connected and working together, their vision for technology becomes clearer. More important, their vision for increasing student achievement for individual students as well as entire schools becomes more focused. They see more accurate and consistent data about students, and clear displays of a vast array of data that they can turn into specific action in the classroom tomorrow.

A Focus on the Student

Without the technology, the only common connecting element in education is the student. What if everything describing the student (demographics), everything the student does (learning), and everything illustrating what a student knows and is able to do (performance demonstrating learning) were connected? One student information system with the same naming conventions used for all aspects of a student's tenure in a school district saves time and increases the accuracy of the data throughout the system.

To illustrate, let's look at one student — Emma, who is transferring from another district in the same state — to see how this technology, just coming of age, will change the education system for her benefit.

When Emma enrolls in school, enrollment data about her is entered into a student information system one time. This is the last time this information needs to be entered. She is placed into a fourth-grade class, and her name and information is linked to the teacher, the grade, the school and the district. Emma's teacher sees her on the roster and in her gradebook instantaneously.

When in class the following week, Emma takes a math test online that is tied to the district and state standards. The results of the test are available to Emma's teacher, her principal and educators at the district office. So are the results of all fourth-grade students who took the test. The results can be disaggregated and analyzed in a variety of ways. Emma's teacher wants to know how each of her students is doing on each standard tested. Emma's principal is piloting two different textbooks and wants to know if the results are different in those two classes. She also is interested in whether or not teachers who took the extended summer academy in small-group instruction are having different results from those who did not go to the academy. In the central office, the math curriculum coordinator is interested in the difference in results across campuses and across demographic groups. Emma's campus had particular problems with reading graphs, so the coordinator begins plans for appropriate pro-

fessional development activities for the teachers.

The next day in class, Emma found out that she did very well on all standards except the one on fractions. Her teacher has scheduled 15 minutes a day for Emma to learn about fractions. She also e-mailed Emma's parents about resources they could use at home to address the performance gap.

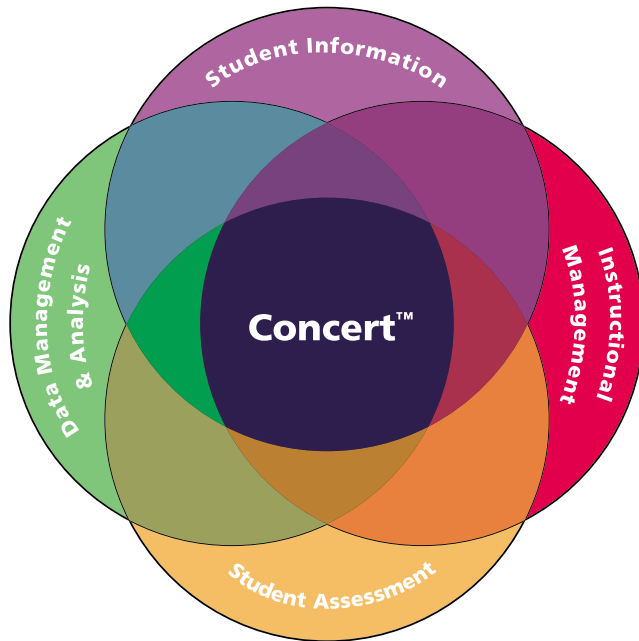
What is going on here is the power of connection among four key elements: an instruction system for the teacher, an assessment system, and a reporting system that can use disparate sources of information, all tied into a student information system using the same baseline student data. At the center is the student and the informed instructor in the classroom, but the student's parents are kept up to date not only with information about how she is doing, but also with specific activities to help at home. Without the connection through the student information system, these activities would be overwhelming for a teacher to do with all of his or her students.

There is a suite of products now available to school districts which enables teachers and administrators to share this vision of connection today. Concert — a Student Information, Assessment and Instruction Suite — connects these four components so that data flows seamlessly among them to fulfill the vision we saw of Emma illustrated above. Concert takes its already powerful student information system and existing instructional management solution and ties that with an enhanced Web-based assessment system and data analysis tool for a solution tailored for enhancing student progress in this time of accountability.

Changing Roles of Testing & Technology

As noted above, Web-based testing programs and data analysis tools are relatively new in education. It is important to take a look at where these tools are now and where they may be going. The emphasis on student progress as measured by the statewide testing programs demanded by state accountability systems has impacted schools significantly as the No Child Left Behind Act has been implemented. This pressure is enormous, and educators are searching for ways to increase student achievement and close the achievement gap between and among disparate groups as measured by these tests before testing requirements are in place for the 2005-2006 school year.

Using standards-based instruction as the basis for accountability has focused the attention of legislators, parents, educators and students on student performance. In the



Concert connects the critical functions of student information, instructional management, student assessment, and data management/data analysis.

past, that assessment was delivered only on end-of-year, summative statewide tests. While high-stakes assessment is getting the attention, educators are realizing that one rearview-mirror look at students is too little, too late to allow teachers to modify their instruction. To ensure that students are making progress in mastering the standards, teachers need to know how the students are doing more than once a year. Technology can play a key role here. A Web-based assessment program that is tied to standards and allows educators to create tests and then see the results arrayed in various ways is proving to be a powerful tool.

Research is showing that success in student achievement is centered on continuously monitoring performance — finding out *often* what a student knows and is able to do. These assessments from multiple sources need to be tied to the state standards and test objectives as well as connect to the student information system.

A good Web-based assessment system such as Concert Assessment provides educators with a tool to create tests tied to their district and state standards that can be delivered either online or on paper. From the instructional perspective, by testing periodically, teachers and administrators can track student progress standard by standard and student by student.

The system should be able to be used in two ways: district

deployment or teacher deployment. In the district deployment, the district manages all aspects of the testing process from creation and administration to scoring and distributing results. This allows classroom teachers to focus on what they do best — teaching. Over time, some teachers can construct their own tests. Concert Assessment provides tools to analyze specific test items and tests. The resultant statistics help the test creators understand if the items are working as they are supposed to. This makes tests more valid and reliable.

Districts and states are moving from traditional multiple-choice test items focused on lower-level skills to enhanced multiple-choice test items assessing higher-level procedural skills. In addition, Web-based assessment programs can score both multiple-choice question formats and extended-response question formats, including essays. Technology is proving to be highly accurate in assessing extended-response questions. This is extremely important because the format and content of a test can affect instruction. If the content of a test is lower-level skills, teachers will provide similar instruction. If the content uses enhanced multiple-choice items or the test format requires students to construct responses, there is a greater likelihood of higher-level thinking skills being addressed. Deploying such a test will support teachers using instruction addressed at higher-level thinking skills.

With the instruction and assessment systems connected, common links to instructional resources and insight into professional development needs can be tied to standards. If a student or group of students is having difficulty learning a particular standard, there are links available to aligned instructional resources. The capability to link directly from test results to resources is another illustration of the power of connections.

Data Analysis

A system that can store up-to-date information on students, test scores and other performance data, and display that information in a variety of ways keyed to a specific audience, is critically important to understanding student progress. Concert Inform provides these capabilities in such a way that a user can look at data at the district, school, classroom and student levels — aggregated or disaggregated — in a variety of graphical or tabular formats. It also can incorporate data from multiple sources. As a result, a teacher can click on a student's name and see all performance data from state tests, district tests and national normed tests all compared to cut scores entered by the district. Having access to multiple displays of

the data can provide the level of detail necessary for a conference with parents and for analysis in comparison to other students in the class and across the district. It also allows teachers to provide much more fully informed instruction.

Connecting Concert Inform to the student information system provides huge efficiencies on top of the enhanced decision-making. There is no need for additional data entry, and the data are the same in the analysis and decision support tool as they are in the attendance roster. The opportunity for data entry error is diminished to near zero by having everything connected to one student information system.

Having a fully connected set of tools allows the monitoring of student progress throughout the extended learning community:

- The superintendent focuses on analyzing and interpreting data from the assessments (student learning), as well as additional information about how the school operates garnered from, among other sources, the student information system. The analysis and interpretation includes disaggregation of the data at least in the same way the state's accountability system requires, as well as by schools.
- The principal monitors progress against the school improvement plan, and uses assessment results to look at both student and teacher performance continuously, not just once a year. By analyzing performance at various times throughout the year, the principal can assess strengths and weaknesses for modification in future school improvement plans. These modifications will affect everything from instruction, curriculum plans and professional development plans to budgets.
- The teacher uses assessment results both to monitor student performance and, where needed, modify instructional practices. This process begins before the school year starts when the teacher looks at each student's prior assessment data.
- The parent can be provided accurate, current and easy-to-understand information. Some districts may choose to provide this information and additional communication via the Internet, while others may choose more traditional approaches. The key is that the information is accurate because it comes from an integrated system, and it will be

available in a variety of levels of detail and a variety of displays. By having accurate and current information, teachers are able to communicate effectively with parents and address individual performance issues. Making accurate, current and easy-to-understand information available to parents fosters an environment where they gain confidence in the school and their child's education.

Monitoring performance means parents and community members are informed of school progress and able to become active participants in their child's education. Parents are aware in a timely manner of test schedules, special events, assigned homework and much more. Parents have a single place, populated with current, accurate information, to find everything about their child, including instructional resources that they can use with their child.

The suite of Concert solutions delivers on the promise of technology today to each of the stakeholders. Parents are able to see a comprehensive, day-by-day view of their child's instruction and progress. Administrators are able to recognize and correct school and district instructional needs and focus on school improvement. Teachers are able to do what they do best — teach — with the latest and best information. All this ensures that the purpose of education is to make sure that the Emmas of the world are successful in their education.

Burke's *Connections* establishes idiosyncratic relationships between science, technology and social change. Concert connects the critical relationships of student information, instructional management, assessment and data management/data analysis. It shows how everything works together to achieve the vision of increasing student achievement: People, ideas and information coming together for learning.

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