

## COMMENTARY

### 11 Ways to Make Data Analytics Work for K-12

By Irving Hamer

The drive to close achievement gaps and eliminate chronic low performance has become a quest for the K-12 Holy Grail. We know what we are looking for and why, and see clues to success everywhere.

In public education, the promise of data-informed decisions that drive instruction, improve student and school performance, and close achievement gaps appears limitless.

But schools, districts, and most K-12 leadership teams are not close to realizing the kinds of data-driven benefits that already exist in fields like financial services, medicine, and science.

There are numerous reasons for this. In large part, the problem starts with failing to customize data programs for education-specific missions and becoming distracted by "snapshots" of data, including early-warning systems that rely on one-time impressions of student performance.

In public education, data analysis offers the foundation for smarter decisions. The key lies in integrating and adapting data systems so they provide meaningful information that helps educators and schools adjust to their individual students' needs. To get there, certain changes need to happen.

Certainly, it is important to routinely generate reports from student-information systems. But such reports often represent aggregate views of student and school data devoid of the deep visualizations that are critical to strategic and tactical judgments.

Beyond that, there is the practice of adopting tools from other industries, mostly business, and forcing them into education uses without revamping them. A prime example would be using an analytic tool designed for financial services to analyze assessment data in a school or district. The usefulness of the tool simply doesn't transfer. Here, the instinct is right, but the practice is wrong-headed.

We can learn valuable lessons from other industries, but they must be considered in terms of their practicality for public education.

For example, every state collects student and school information; millions of pieces of data are archived in data warehouses. But the archived data are seldom, if ever, consequential to school or district leaders or classroom teachers. Once archived, most of the information is never touched again.

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**"In public education, data analysis offers the foundation for smarter decisions."**

By contrast, organizations that live and thrive by the management of big data—Google, Facebook, *Consumer Reports*, Bloomberg, and the U.S. Census Bureau—use their archived data routinely. For such organizations, the value of data analytics is compelling, and the daily use of data analytics is essential and fundamental to the work they do. Such is, or should be, the case in public education.

At least 11 compelling "value propositions" (a business term for promised values for customers) are crucial to the successful use of data in public education. Any claim of data-driven decisionmaking where the value propositions are not evident and transparent is delusional.

**1.** Data tools must be able to pinpoint the strengths and weaknesses of a district, school, classroom, students, grade levels, or teachers. Such findings require deep insights into the teaching and learning activities taking place in the organization.

The strengths and weaknesses of an educational organization are not evident in the standard annual report of a state agency or the reporting requirements of the U.S. Department of Education. This is also true of early-warning systems designed to flag students who may have learning problems later on.

**2.** District and school leadership teams must have immediate access to every data point necessary for teaching, learning, and accountability.

Twenty-four hours after data have been archived, the information must be available for analytic use. Delayed reporting is a fatal flaw of accountability testing. Generally, the analysis of results has very little consequence for teaching and learning in the current school year, and almost no influence on the planning for the upcoming school year, because the data are not immediately available.

**3.** The data must reveal patterns and opportunities for student and/or school growth. Because it is possible for students to improve their test scores without demonstrating growth in their content knowledge or academic skills, it is imperative that practitioners be able to see whether students are simply improving their test scores or truly learning more and better. To do this, the data must reflect engagement and performance over an extended period of time.

Annual or semiannual reports on test scores are inadequate for capturing achievement and growth for students and schools.

**4.** To make informed judgments about teacher effectiveness, student achievement, and growth, data must be linked to teacher evaluation and professional development needs.

The data must allow analyses of instructional strands from formative assessments. This enables teachers who need support to get what they need to strengthen their pedagogy and content knowledge.

**5.** Administrators and teachers must be able to make easy and quick correlations, conduct cross-referencing, and access comprehensive student profiles in an on-demand, data-rich environment.

When a new data point becomes available, it must be accessible to educators quickly (within 24 hours) for there to be any hope of using instructional and developmental time well.

**6.** There must be ways to present historical and trend data in various motifs—graphs, matrices; aggregated, disaggregated. The lessons embedded in historical and trend data often help explain current conditions and performance. The visualized data must allow for queries that can be

answered by mining various data fields.

**7.** The data must elevate conversations with and between stakeholders. Assumptions and feelings must be informed by real-time analyses of relevant data.

**8.** Teachers and administrators must be empowered to do the data mining that is critical to student achievement and growth.

Information-technology professionals must focus on data fidelity, end-user support, and technology infrastructure instead of being confined to managing data and generating reports with marginal utility.

**9.** Real-time data mining must support the development of strategies and tactics to close achievement gaps.

Queries about the data on individuals or groups are essential to understanding achievement gaps and what might be done to eliminate them. Correspondingly, all objectives to improve achievement must be informed by highly nuanced data.

**10.** Effective teaching must be the object of analyses of observations and evaluations, which would have to be anchored in timely qualitative and quantitative data.

**11.** Analytics should modernize and transform the use of student-information systems from static warehouses to information resources. The goal is to get data into the hands of those working in schools and classrooms.

To build meaningful personalized learning experiences from data, educators must have a deep understanding of every student's circumstances—including academics, behavior, demographics, growth and development, and history.

With such insights, teachers and education leaders can target issues with appropriate interventions and personalize teaching and learning effectively.

This new frontier in big data must be integrated into education to accelerate achievement for all students.

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