

Predictive Analytics



Incorporate the use of data for decision-making and predictive modeling of student-centric outcomes to improve education systems, processes and policy.

What is the issue and why is it important? What if SREB states do not make adequate progress on this issue?

Education has only recently begun to adjust to the culture of big data. So, what is “big data?” It is data from a wide variety of sources including learning management systems, student information systems, enterprise resource planning systems, data warehouses, longitudinal data systems, vendor systems and countless devices and sensors. Education leaders and policy makers are steeped in so much data they often don’t know how to make sense of it all. They spend resources on education and need accountability and return on investment to justify additional funding. Unless they can gather and interpret data from a variety of sources, they generally don’t know what works, what has limited results and what would work better with modifications.

Systematic mining of data can help these leaders find what each student and teacher needs to grow toward better outcomes. For example, good data analysis can point teachers toward timely professional development to help them help their students. Because no two students are alike — each has unique gaps in knowledge or understanding — they, like their teachers, benefit from predictive modeling and artificial intelligence to guide their paths to a better education. Schools and districts not using these tools effectively squander both time and dollars in guessing what students need. Education leaders can also use predictive models based on descriptive data and diagnostics to choose educational technology systems that would better serve their goals for educational improvement. These models often show trends in data that would otherwise not be apparent and can help direct decisions toward educational improvement and efficiency.

It takes time for education to catch up to technology trends, but effective use of data can shorten the time lag. The use of quality, pertinent data to resolve educational problems, inform academic practices, and refine applicable policies should be of the utmost importance in efforts to reach national and state education goals. Studies show that although the United States is graduating more students from high school than anywhere else in the world, our students are not performing as highly on some education outcomes as students elsewhere. Data analytics can help us to

determine why some schools fail while others thrive, then guide our recommendations and planning throughout the process of school improvement. Both educators and administrators need access to data dashboards to use current data and analytics for timely student intervention and improved outcomes.

Education stakeholders must be aware of predictive modeling processes and be informed on the analytics and algorithms — mathematical formulas used in data modeling — if they are to make informed decisions and policies.

As many states move toward performance-related funding models, they need to address multiple measures of progress on performance, from the student level to the teacher, school, district, system and state levels, through postsecondary performance, and into the workforce. At the individual student

level, failing to identify patterns in data will lead to missed opportunities to create personalized learning programs, or to intervene with at-risk students to ensure they complete high school or college. On a larger scale, that failure will result in misguided policies that invest precious resources in ineffective programs. Transparent data policies and practices are critical to public acceptance and trust. Education stakeholders must be aware of predictive modeling processes and be informed on the analytics and algorithms — mathematical formulas used in data modeling — if they are to make informed decisions and policies. Slight changes in algorithms can lead to substantially different predicted outcomes and results.

Predictive analytics can enhance state economies and job opportunities for residents by accelerating educational attainment, improving student support systems, and gaining insight through predictive modeling that humans cannot see. Such analytics are a powerful tool for making full, efficient use of the data generated by the technology systems that support education. Resources to support these systems, along with transparent communication and effective training, can bring an improved return on investment.