

## THE POWER OF VISUALIZATION

### TABLEAU, AN EXAMPLE OF HOW DATA ANALYSIS CAN SUPPORT STUDENT SUCCESS

Let's say you wanted to know how chronically absent students in your school were performing on the grades 3-8 state tests. Or, how your seventh-grade students were doing on high-priority state standards compared with other schools in the region. With a data analysis tool like Tableau, you can do more than just find this information out – you can see it.

"Seeing" in this case means being able to quickly view the information, in colorful charts, graphs and other visuals, and begin to draw some conclusions and have conversations about better ways to support students.

Tableau is a so-called "visual analytics platform," which allows organizations to interact with the information that is available to them. As described in detail on the next page, schools using Tableau continue to ensure student privacy and security. Tableau is used by global organizations (from Verizon to Lufthansa to Hello Fresh) to help them better connect and understand information *that they already have* to make changes and drive improvement efforts.

Given the amount of information schools have about students and their academic performance, why wouldn't educators want to have access to such a powerful tool? The answer is that they do.

"People are hungry to find the right datasets to help them make some really pivotal changes in their districts," said Theresa Billington, who is a leader in the work that Capital Region BOCES in Albany is doing with partner school districts using Tableau. "If we can present the data in a way that it's easy for people to digest and understand, then we can spend more time on the critical aspects of making those changes."

Billington adds that one of the great things about Tableau is that it connects multiple datasets and that filtering and sorting information to view it in different ways just takes a few mouse clicks.



### DATA VISUALIZATION: AN INTRODUCTION

Data visualization simply refers to any way that data is presented visually to help enhance the understanding of what it means. It often involves connecting multiple data points to analyze past performance, draw conclusions and drive conversations about future plans and improvements. Tableau and tools like it provide the analysis in powerful visuals that are often interactive, allowing users to look at the data in a different way or sort it based on different parameters. Here is an example: If a school district wants to know how economically-disadvantaged students did on the fourth grade English Language Arts assessment by priority standards compared to the BOCES region, with a few mouse clicks, a heat map could be generated to show the results. Green could be used to show areas of strength and red where the group's performance was below the region.

## IS TABLEAU SECURE FOR SCHOOLS?

In a word, yes. Schools are focused on protecting student privacy and data security with any tool that they use. The information that BOCES uses to create the interactive data reports is not sent to Tableau or stored on Tableau servers. It is housed in the same way that BOCES and the Northeast Regional Information Center (NERIC) stores other student information and data reports, which features extensive security protections and protocols. Additionally, the team that is leading the Tableau initiative manages permissions so that only authorized school administrators can see the information – and only for their school or district. All users are identified as “viewers” in the system, which means that they have no ability to import their own data sources or create customized reports. In short, only people who are already authorized to view the information can see it and student data does not leave the secure servers. What Tableau does is connect various data points for visual analysis better than many systems in place. Finally, any system that interacts with student information data is subject to an Education Law 2-d Data Privacy Agreement, providing an extensive safeguard for student information.

## TIME: THE MOST VALUABLE RESOURCE

Conversations with educators about using data almost inevitably turn to frustration with the amount of time it takes to get actionable information – in other words, it takes too long to identify real changes that will help students in the classroom. This frustration was evident in a series of listening sessions that took place across the state in the fall of 2019 and in more recent interviews with educators. The problem is that for all of the data on student performance that is kept and reported, there is not a common statewide standard of schools having the ability to view and explore data in a timely and manageable way. This amounts to lost time in the process of making better decisions to support learning.

This is where a tool such as Tableau has the potential to make a big difference. It reduces or even eliminates the time needed to analyze information so that educators can move the conversation to action.

“It saved us a ton of time from hand manipulation to simply clicking buttons,” said Karen Swain, assistant superintendent for curriculum and instruction at the Scotia-Glenville Central School District in Schenectady County. “There is an incredible amount of power in a data management

system that allows you to save time and shows you what you want to see, what you need to see.”

**Tableau is an example of a data visualization tool. The power comes from getting to the action step quicker. Based on their reactions, teachers agree.**

The work that Swain’s team did with Tableau through Capital Region BOCES focused first on middle-level English Language Arts. They started with “heat maps” that showed how her district’s students were performing in comparison with

the region on the standards that were most prioritized on state assessments. What popped out immediately was lagging performance in middle school in the standards that focused on identifying the main idea and key details in text passages.

“We were really able to dial in our instructional decisions, our curricular decisions based on that gap area that Tableau identified for us,” Swain said.

Clifford Bird, principal of Abram Lansing Elementary School in Albany County’s Cohoes City School District puts the time-saving power of Tableau another way: “I have 400 kids and a building to run,” Bird said. “I’m not paid to be a data manager. Whenever I can grab something that helps me day-to-day and improve what we are doing here and still do my other job, it is fabulous.”

### ON THE FIRST TIME WORKING WITH TABLEAU

“The team’s reaction was immediately, ‘When do we get this for math? Will we get the same thing?’ The team was super excited. They were asking for more which, in work around data, folks are not typically asking for more, but I think it was really a high-value move.”

**Karen Swain**  
Assistant Superintendent for Curriculum & Instruction  
Scotia-Glenville Central School District



The work that Bird’s school has done with Tableau has enabled his teachers to see how the district is doing on high-priority state standards. “Tableau pulls that all out for us so we can see how well our students did based on the specific standards and then compare it to the standards that the state asks for year after year,” he said. “It makes my teachers’ jobs easier and helps them to focus more on the essential standards. They’re much more at ease of not having to understand what’s on the peripheral but we can hone in on what the necessary pieces are.”

## “THEY WERE ASKING FOR MORE”

Bird emphasized the importance of teachers having access to effective data analysis and visualization tools. “Me working in my office doesn’t make any difference to a fourth grader who’s challenged in reading, where getting a better understanding of what data tells that fourth grade teacher we should be looking at makes a whole world of difference,” he said.

Tableau, and tools like it, have the potential to bring important information to teachers in a much more digestible way. The work that Capital Region BOCES has done with Tableau so far has typically involved teams of instructional leaders and teachers looking at a particular area or subset of students. This is often because of a school’s designation of needing improvement under the Every Student Succeeds Act.

Swain recalls the response after the English Language Arts heat maps were shared with middle school educators in Scotia-Glenville. “The team’s reaction was immediately, ‘When do we get this for math? Will we get the same thing?’” she said. “The team was super excited. They were asking for more which, in work around data, folks are not typically asking for more. I think it was really a high value move.”

**Investing in information analysis was called a “high-value move” by one assistant superintendent.**

Swain went as far as to say that at times educators can find data “scary” even. Tableau, she said, helps identify practical applications in the classroom to help students, which changes the entire conversation.

Billington, from Capital Region BOCES, said wanting to get the information from Tableau into more teachers’ hands is a common response to the tool. Better use of data is all about understanding what’s working and what’s not – and when things aren’t working, ensuring that the professional educators can have a conversation about solutions. Tools like Tableau get you to that conversation much more quickly than the tools and practices of the past. Most educators have never had anything like it.

“It’s easy. That’s the value. It’s easy for people to interpret, analyze figure out problems but also start to have those conversations about solutions,” she said.





### About the Statewide Data

**Conversation Project:** The district superintendents of the 37 Boards of Cooperative Educational Services (BOCES) in New York have identified the need for education stakeholders to have meaningful and productive conversation about the best way to use student data to improve education. This paper is a continuation of the conversation, as the BOCES leaders recognize that a failure to come together to ensure best practices, both to improve instruction and ensure privacy and security, will result in missed opportunities to strengthen education for the students of New York. Funding to support this continued conversation was provided, in part, through a grant from the Bill & Melinda Gates Foundation. Additional financial and staff support was provided by Capital Region BOCES.