



Data-Driven Instruction in the K¹² Virtual Learning Environment

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Analyzing Data and Changing Teaching to Improve Student Learning

In many K¹² schools, teachers are talking about data on student academic performance—not just talking but analyzing the data and, based on their insights, changing the way they teach. It’s all part of an effort to improve student academic achievement by implementing the principles of Data-Driven Instruction (DDI).

DDI is a set of instructional strategies that engage teachers in regularly analyzing quantifiable data from student assessments and other metrics. Based on their analyses, teachers modify instruction with the goal of improving student academic achievement.

Schools have been implementing DDI programs for a decade or more, but virtual schools—which, in K¹²’s case, have tools for automated collection and reporting of student performance data—offer new opportunities for efficiently applying DDI principles. Recently, teachers in many K¹² public school programs participated in training on principles and practices of data-driven instruction. Both trainers and teachers were guided in part by Paul Bambrick-Santoyo’s *Driven by Data: A Practical Guide to Improve Instruction*,¹ which recommends that schools integrate four principles of DDI: assessment, analysis, action, and culture.

As the implementation of DDI goes forward at many K¹² schools, we at K12 Inc. look forward to gathering student performance data and reporting on the results. In this paper, our focus is on introducing the four principles of DDI, and sharing observations and experiences from teachers and administrators in various K¹² schools who are working to turn DDI principles into practice.

¹ Bambrick-Santoyo, P. (2010). *Driven by Data: A Practical Guide to Improve Instruction*. San Francisco, California: Jossey-Bass.



Assessment: Focusing on What Students Actually Learned

Data-driven schools, says Paul Bambrick-Santoyo, “should constantly focus on one simple question: are our students learning?” To answer that question, he argues, schools must “break from the traditional emphasis on what teachers ostensibly taught in favor of a clear-eyed, fact-based focus on what students actually learned.”²

To understand “what students actually learned,” teachers need data from assessments. Teachers in K¹² public school programs have ready access to assessment data from various sources. For example:

- The Learning Management System in the K¹² Online School (OLS) tracks data from each student’s performance on assessments linked to the K¹² curriculum, both formative and summative, including lesson-level checkpoints, unit tests, and end-of-semester exams.
- Many K¹² schools complement the K¹² curriculum with supplemental standards-based programs for test prep and skills practice. These online programs also provide detailed reports with data on student mastery of grade-level standards.
- In synchronous sessions—virtual meeting rooms in which K¹² teachers engage students in small groups for targeted instruction—teachers use online tools (such as whiteboards, chat, or polling) to administer brief real-time assessments to gauge student understanding.

DDI focuses renewed attention on state standards. As Bambrick-Santoyo emphasizes, because of the importance of student performance on state tests, assessments, to be effective, must be regular, rigorous, and aligned to state

standards. Kayleen Marble, academic administrator at Louisiana Virtual Charter Academy (LAVCA), notes that DDI compels “more focus on what is being taught. Teachers have come to be content specialists—they are expected to know the standards and what the state expects. They also are expected to prioritize the skills and know the most important standards and spend time on the things that count the most and will help the students the most.”

LAVCA teachers, says Ms. Marble, “used to just plunge on ahead through the pacing guide,” but now they are taking extra care to ensure “that their teaching is aligned with standards.” Ms. Marble points to the example of a LAVCA high school geometry teacher who became both “more reflective” and more effective after DDI training. “Her students,” says Ms. Marble, “get multiple chances to learn the standards because interim assessments revealed to her that she needed to go back and reinforce earlier topics.” As a result, more of this teacher’s students are performing at higher levels. From 2013–2014 to 2014–2015, the percentage of this teacher’s students scoring at or above proficiency on the state’s end-of-course test in geometry increased by 13.5 percentage points.

Acknowledging the importance of state standards and their related assessments, educators at Indiana’s Hoosier Academies Virtual School, which began implementing DDI in 2013–2014, have opted to begin each school year by developing an assessment calendar that builds in diagnostic, benchmark, and interim assessments, all tied to state standards. Patricia Herron, Hoosier’s K–8 academic administrator during the 2014–2015 school year, says, “We work with the Indiana Department of Education to develop documents for teachers to check which quarter the standard will be taught.” With this detailed calendar, Hoosier’s teachers can confirm whether all state standards are covered in the K¹² Online School curriculum, and take steps to fill gaps or adjust the schedule so that students are taught the standards before the state’s testing administration dates.

² Bambrick-Santoyo, p. xxv.

Analysis: Unlocking the Data

While K¹² teachers have plenty of student assessment data, the power of that data is only unlocked through analysis.

During the first year of implementing DDI, Hoosier Virtual teachers worked to establish effective protocols for regularly analyzing student data. With guidance from DDI support staff from K¹²'s Northern Region, Hoosier teachers and administrators gathered in weekly data meetings to analyze results from assessments in both the K¹² curriculum and supplemental programs. They also examined other metrics such as student attendance data.

Weekly data meetings have become an important and essential part of the instructional program in many K¹² schools. In these meetings, teachers gather to discuss patterns in data that reveal student strengths and weaknesses, and to share ideas to address challenges. Michelle Scionti, Middle school assistant principal at Arizona Virtual Academy (AZVA), reports that with DDI “the teachers know their students better because they are digging in to their data and analyzing it to see what it is telling them. Everything we do with our students comes from the data we’ve gathered and analyzed.”

What goes on at Idaho Virtual Academy, as related by Head of School Kelly Edginton, describes what is happening at many K¹² schools: “We ‘talk data’ constantly as a school, in departments, in regular Professional Learning Community meetings, and one on one. School staff is highly engaged in wanting to know where their students are and helping them make academic progress in order to achieve grade level goals and beyond.”

Action: Adjusting Instruction to Improve Results

In a data-driven school, assessment and analysis are the necessary precursors to action—specifically, in Bambrick-Santoyo’s words, “changing teaching to enhance learning.”³ As April Warren, academic administrator for California Virtual Academies (CAVA), says, teachers need to move from asking “What does this assessment tell us?” to “What do we do next?” Before DDI, says Ms. Warren, “teachers looked at data as ‘This is where my students are.’ Now, they ask, ‘What am I going to do about it?’”

At LAVCA, Kayleen Marble has observed many teachers changing their practices in response to what they learn from analyzing student data. She cites a fourth grade teacher of English language arts and history, Jessica Tekell, who uses data “to know which topics to spend less time with—just a review and move on—and which ones need more in-depth work or review.” In her analysis of third-quarter interim data, Ms. Tekell “discovered that some big concepts taught during the first quarter were no longer showing as mastered.” Knowing this, she “began to work in the big items, such as inference and textual evidence, multiple times throughout the year” to ensure mastery.

AZVA’s Michelle Scionti notes that with DDI, middle school teachers have become “more purpose-driven in their instruction. The teachers are using formative assessments to make adjustments during the lesson.” AZVA Elementary Principal Kimberly Young reports that in Reading lessons, AZVA students complete “self-assessments on concepts and skills, and we chart their fluency growth during the cycle. Teachers are focusing on those items that make a good reader instead of doing the same activity every day in class.” With DDI, Ms. Young affirms, “teachers are better able to dig down into conceptual components to build foundational skills to bring students to mastery.”

John McMurray, K¹²'s Northern Region Academic Administrator, has observed how Hoosier Virtual’s high school teachers took action based on data that revealed student weakness in specific question types in Mathematics. Based on their analysis of the data, the teachers developed brief daily assessments, including warm-up activities and quizzes, to give students practice with more varied and rigorous question types likely to be used in state assessments.

In the elementary grades at Hoosier Virtual, teachers developed action plans that focused on how to modify instruction in synchronous sessions. Hoosier teachers use a template called the “50 Minute Data Document” to plan a synchronous session. To focus instruction, the Data Document

- identifies the state standard or assessment questions not yet mastered,
- provides brief analysis of the obstacles to learning, and
- specifies actions to be taken to address student needs.

Figure 1 shows a sample Data Document from Kristen Bauer, a Hoosier first grade teacher. (Note that students’ names have been withheld to protect confidentiality.) In the sample, “Class Connect” refers to online synchronous instructional sessions.

³ Bambrick-Santoyo, p. 69.

FIGURE 1: SAMPLE HOOSIER FIRST GRADE 50 MINUTE DATA DOCUMENT

February Interim Assessment		Date: February 23–27, 2015	
STANDARDS/ QUESTIONS that were not mastered	ANALYSIS What misunderstandings are revealed in the data? Why do you think students failed to reach mastery? What gaps in instruction of the standard contributed to the misunderstanding?	ACTION STEPS What will you do to help students achieve mastery?	
<p>Place Value 1.NS.2 -</p> <p><i>Student will be able to demonstrate understanding that 10 can be thought of as a group of ten ones — called a “ten.”</i></p> <p><i>Understand that the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.</i></p> <p><i>Understand that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).</i></p>	<p>During the interim assessment, these students did not demonstrate understanding of using base ten blocks to model a given numeral 1–99. When asked how many tens and/or ones are in a given numeral 1–99, these students were unsure.</p> <p>These students failed to meet mastery due to lack of understanding that double digit numbers can be thought of as a group of tens and ones.</p> <p>Potential learning gaps might include misunderstanding of one to one correspondence and/or misunderstanding of how a group of 10 ones = 1 ten.</p>	<p>RETEACH ACTIVITY:</p> <p>Students to Target:</p> <p>Student A ✓ Student B Student C ✓ Student D ✓ Student E ✓ Student F ✓ Student G</p> <p>March 3 – Required Class Connect</p> <ul style="list-style-type: none"> Practice modeling numbers 1–9 on place value chart using base ten blocks whiteboard. Media- (song and visual representation of place value chart and base ten blocks— see YouTube video). Practice modeling numbers 10–90 with zero in one’s place on place value chart using base ten blocks whiteboard using “I do, we do, you do” method. Practice modeling random numbers 10–99 using Think, Pair and Share (breakout rooms then share with main room). Exit activity to demonstrate mastery of concepts taught. 	<p>MEASURABLE GOAL/ TIMELINE:</p> <p>Given random numerals 1–100, students will be able to draw the correct number of tens and ones using a place value chart and articulate the correct number of tens and ones in a given number by April 13–17 (next interim assessment).</p> <p>✓ = Students attended required Class Connect and mastered exit activity. These students will be assessed again to confirm mastery at the next interim assessment scheduled for April 13–17.</p> <p>For any students without ✓, teacher will follow up with Learning Coach to discuss possible misconceptions and plan support.</p>

Culture: Driving School Transformation

Bambrick-Santoyo defines the fourth principle of DDI as “Culture: Create an environment in which data-driven instruction can survive and thrive.”⁴

It’s not always easy to create this data-driven culture. When Hoosier Virtual first introduced DDI, teachers and administrators were not accustomed to spending so much time administering so many assessments, analyzing student results, and developing action plans to improve instruction.

CAVA’s April Warren has noticed that some high school teachers “have a hard time using data not directly tied to their content, and may be less willing to use data that shows a need to fill in a gap, insisting they have to push on.” Elementary teachers, Ms. Warren notes, sometimes ask, “Are we assessing too much?” And some families, she says, initially bristle when discussions of student progress emphasize test data. But, says Ms. Warren, “when teachers use multiple data points and focus on both what the scores mean and what to do, then families come around.”

In the K¹² virtual learning environment, DDI builds ties between the school and families by strengthening the partnership between Learning Coach and teacher. AZVA’s Michelle Scionti notes, “We all speak the same language, and that goes from Learning Coach to student to staff. When we are discussing a student’s performance with a Learning Coach, we can clearly explain where the student’s learning needs are and what steps we will take to fill that gap.” AZVA Special Education Manager Brook Mosley-Schubert affirms that “families are getting used to data-based decisions. They appreciate hearing about how their student has grown academically.”

A focus on test scores and assessment results might seem to risk turning education into a mechanical numbers game played on an impersonal array of spreadsheets. But many K¹² educators report that, in practice, data humanizes and individualizes the educational experience. AZVA High

School Principal Veronica Murray says, “Teachers are able to approach students with more knowledge about where and why they struggle.” Kimberly Young adds, “DDI has changed teachers’ relationships with their students because they know more about what they should target for specific students. They can provide more information to the family about what type of support or help the student needs.”

LAVCA’s Kayleen Marble sums it up: “Before DDI, we were looking at the group, and now we focus more on the individual. Data becomes names, not numbers.”

DDI is also helping to foster a more collaborative culture in K¹² schools. Because of regularly scheduled data meetings, K¹² teachers work more strategically as a team. They figure out how to best divide tasks and group students. They coordinate observations with fellow teachers in order to learn techniques they can use in their own synchronous sessions, especially in targeted interventions and small group instruction.

For Hoosier Virtual’s administrators, DDI has prompted a shift from school leadership to instructional leadership. Hoosier’s administrators now spend more time observing teachers in synchronous sessions and working with them in data meetings to focus on improving student outcomes. Administrators are also working to provide teachers with streamlined data reporting and DDI-related professional development. Academic Administrator Patricia Herron says that “Hoosier has become a very positive environment. Teachers are ‘owning’ student data and their decisions.”

As a strong culture of DDI takes root at many K¹² schools, instructional decisions are made with data in mind. Teachers are regularly assessing students, analyzing the data, and collaborating to move students forward and improve academic performance. Before DDI, says AZVA’s Kimberly Young, “we were checking off boxes as we moved down the list of items that we taught. Now I see our teachers more engaged and energized, knowing that they can tackle problem areas.” Veronica Murray of AZVA offers a conclusion that echoes reports from many K¹² schools: “DDI has helped us to expect more from ourselves and from our students.”

⁴ Bambrick-Santoyo, p. xxvi.