0–60 MPH: Data-Phobic to Data-Driven

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Abstract: As educators, we need to stop fearing data and embrace its power. This article discusses how classroom teachers can design, implement, and analyze longitudinal assessments to diagnose issues related to student achievement and meet the demands of our evolving data-driven educational culture. Practical advice on exam production and data analysis provide a footprint which allows teachers to begin the process locally and immediately.

Keywords: data-driven, assessment

Every fall followed the same routine. Inevitably, a department meeting occurred around Thanksgiving when the previous year’s standardized test scores were dropped on my desk with a loud thud. Not everyone in the department shared this experience; the scores were only given to a few teachers who were fortunate enough to have taught sophomores who took the state-mandated exams the year before. And so we pored over the data with a mixture of glee for those students who “met goal” that we never thought would and nausea for both those students who we never expected to pass and those who we were sure would pass but somehow fell short. These data were to be feared.

Changing a Mindset

This year, a colleague and I decided to stop kowtowing to the data. We designed an intermediate exam to be administered between the state-mandated eighth and tenth grade exams to begin generating longitudinal data about student achievement. Our goal was to look for numerical patterns in achievement from the eighth grade through the beginning of sophomore year and identify the students who were most in danger of not meeting goal on the state-mandated exam. Simultaneously, we intended to generate a department action plan to remedy the problem of not meeting goal. Last, we would compare the results of the most at-risk students from the intermediate exam to their actual performances on the state-mandated exam. Using these data, we could make adjustments to both our action plan and curriculum and instruction.

Designing a Valid Assessment

We are teachers. Time is always of the essence, and the process of designing an exam with strong validity and reliability can take months, if not years. Herein lies the problem: how can we obtain longitudinal data today?

The answer is to think within the confines of what we already possess. In our situation, we first obtained eighth-grade standardized exam scores for our current freshman. Next, we went to the state Web site that releases past exam questions. Using these questions, we constructed an intermediate exam that had the same length and content distribution as the exam administered annually by the state. We contacted the state for information about the reliability and validity of their questions, and they e-mailed us a document—much longer than we cared to read—explaining every possible numerical permutation of the data. When the sophomores took their standardized exam in March, we also administered our intermediate assessment to the entire freshman class. With both the eighth-grade scores and the scores from the intermediate exam in hand, we now had longitudinal data from a large sample. Armed with a limited knowledge of statistics and a vast amount of data, it was time to seek patterns that would identify the students most in danger of not meeting goal. The following paragraphs present some lessons we learned from this process.

You Do Not Need to Be a Statistician

You hear me? You do not need to be a statistician to analyze longitudinal data. If you have a quantitative
bent, curiosity, and willingness to work, you will be well on your way to identifying patterns in your data. If you do not fit this profile, then seek out people in your department or district who do. Contact the AP Statistics teacher or do what we did. I called a colleague at a local university who was more than happy (if not eerily elated) to spend some time with my numbers. In less than an hour, she provided me with standard deviations, z-scores, and a beautiful normal distribution that allowed us to identify students who scored more than one standard deviation below the mean. We deemed this group of students to be the most in danger of not passing. In the end, fewer than sixty students out of about 450 were placed in this group.

**Make it All Mean More**

Everyone seems to have a plan to remedy our problems in education. In your district, school, and classroom, conversations are couched in personal, philosophical, and monetary terms. For teachers, however, the question is: now that you have isolated the students most in danger of not meeting goal, what should you do on a day-to-day basis to improve instruction and curriculum to meet these diverse learners’ needs? I have no magic bullet. I could tell you what we propose to do with our sixty at-risk students, but too many variables stand between our students’ success and your students’ success. What I do profess is that two teachers can sit in their classrooms and embrace the concept of data-driven decision making.

We are now seeking patterns in the data and sorting students who are most in danger of not passing by their sex, previous schools attended, attendance profile, potential learning disabilities, and current course grades. We hope that future professional development can be tailored to address the concerns highlighted in this process.

**Build a Data-Driven Culture**

As educators, we need to stop fearing data and embrace its power. To truly increase student achievement, current and accurate data must be generated on an ongoing basis. If proposed changes are not based on reliable measures, we cannot expect to meet district goals. Furthermore, we cannot expect reliable measures to simply appear. Build a data-driven culture yourself. Exhibit leadership, build a committee, and become a data champion. When committees of teachers align curriculum and instructional practices with quantitative data, gains in student achievement can be expected (Noyce, Perda, and Traver 2000).

**What You Need to Know to Build a Data-Driven Culture**

1. Get organized.
2. Learn some statistics.
3. Use graphs to represent data.
4. Think longitudinally.
5. Use technology and databases.
6. Use questions that have already been evaluated for reliability and validity.
7. Make tests easy to grade. Use a Scantron if possible.
8. Enlist the help of colleagues to record and organize data.
9. Survey students’ demographics prior to any exam.
10. Be a leader.

Tape this list to your desk or computer screen. Look at it once in a while between now and the time when the previous year’s standardized test scores are dropped on your desk. And then make a decision to control the data instead of letting it control you. Vanquish the fear, embrace the data, and relish your new role as a data champion.

**REFERENCE**
