Career Readiness Data Handbook – Measuring What Matters

Dr. Richard Jones
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Effective use of data is essential to school improvement. Data enables objective decision making and systematic changes over time.

State accountability is based on a narrow set of standards that do not define everything students to learn to prepare for college, career, and life. The most effective and most rapidly improving schools do not focus on minimum performance, but use higher and broader targets of student achievement.

There are many data measures that can help teachers in their quest to make students more effective learners. Career Readiness Data Handbook — Measuring What Will Matter Most for Students describes when to use data, how to collect it, and how to analyze it and use it effectively.

Most educators are knowledgeable about data that defines grade-level proficiency and preparation for college. However, they have limited experience and data to inform decisions that can support career readiness. This handbook provides recommendations on using data to enhance instruction that leads to both college readiness and career readiness.

There is some overlap with data collection related to state tests and instruction. This is because developing career readiness is not a separate instructional area or intended only for a certain group of students. Career readiness should be a purpose of K-12 education that winds through all instruction at all grade levels and in all subjects.

Most decisions about measures of career readiness are best defined at the district or school level rather than state level. This handbook will guide school administrators and teachers through using data effectively toward the goal of enhancing student career readiness. It explains many of the data measures that can be used to indicate career readiness. For example, there are measures that will inform teacher decisions about instruction and how it relates to the skills students need in preparing for jobs and careers. In addition, educators need to understand the connection between data on workforce requirements and our education system.

The handbook takes a unique approach to presenting recommendations for the use of data in schools. It poses 13 questions related to improving student learning and career readiness. Each chapter offers recommendations for collecting and using appropriate data to answer one of these questions:

- How well do you really know your students?
- Are you measuring what matters?
- How can you tell what your students aren’t learning and what do you do when you know that?
- Once you know who’s not learning, how can you help individual students?
- How do you “grade” student work on performance assessments?
- How can you teach students who read at very different grade levels?
• Are you preparing students for future viable careers?
• How do you know if instructional changes are making a difference in student learning?
• What are your students’ perceptions about school?
• Does your instruction help make students career ready?
• Are your students successful in career and technical education?
• How do you measure “soft skills”?
• How do you know your students are career ready?

The appendix provides a glossary of data-related terms used throughout the handbook. These terms are highlighted in blue in the text.

The explanations and suggestions in this handbook will greatly enhance the everyday work of teachers as they seek to improve instruction and enhance student achievement related to career readiness. This handbook can also support leadership and instructional decision-making in schools.
Chapter 1

How Well Do You Really Know Your Students?

One of the most essential strategies for effective teaching and learning is the act of really getting to know the students who you teach. Extending this notion by truly integrating various aspects of your students’ lives into your instruction enables you to connect with them on a much deeper level, which will likely result in more meaningful learning. Student learning—as facilitated by your teaching—becomes much more applied in nature, since students will be able to see a connection between the content and skills you are teaching and how they relate to their personal lives. This chapter examines five strategies for getting to know your students better: student demographics, interest surveys, career interest measures, learning styles, and multiple intelligences.

Student Demographics
Familiarizing yourself with the student demographic makeup of your school can help you design, structure, and implement instruction that capitalizes on the student characteristics present in your school. Its demographic composition can provide both challenges and opportunities. The more familiar you are with this composition, the more effective your instruction is bound to be. For example, understanding the specific demographic characteristics may enable you and other teachers to identify the nature of various gaps in academic achievement (Bauer & Brazer).

It is important to collect student demographic data from reliable sources. Some data can be collected directly from students; other data will likely need to come from the school or central office (student records, student databases, etc.). You might be able to collect demographic data from students in the form of a simple survey; for example, (James-Ward et al.):

- race
- ethnicity
- gender
- socioeconomic status (SES)
- home language.

Student records are typically school-level data. Examples of centrally maintained data might include the following (Bauer & Brazer; James-Ward, et al.), specified by number and identification of:

- students identified as English language learners or LEP (Limited English Proficient)
- students who have special education learning needs and/or IEPs (Individualized Education Plans)
- students with disabilities
- students who may be dually (or more) identified
- the breakdown of students into federal-defined student subgroups
- attendance and behavioral referral data
- academic performance data (e.g., reading proficiency).

Admittedly, collecting student demographic data will take an investment of time, but the potential payoff is well worth the effort. Instruction that can incorporate and capitalize on the demographic characteristics of your students will make their experiences in your classroom all the more meaningful.
Interest Surveys
When teachers know the kinds of things that interest their students, instruction can be geared toward those interests. This will make the teaching and learning process more meaningful and exciting. Students tend to become much more engaged in learning when it appeals to them. One distinct benefit of utilizing a student interest survey is that it is a relatively easy way to learn what kinds of things pique your students’ interest, including books, music, television shows, movies, sports, social media, current events, etc. Becoming familiar with your students’ interests enables you to connect instruction to things that will grab their attention and to design projects and other academic work that allows them to contextualize the assignment to an area of interest to them.

Many teachers design their own interest surveys, based on the kinds of things they want to know about their students. There are also numerous interest surveys available, both commercially and free of charge. A simple Google search for “student interest survey” will identify numerous possibilities for use with your students. The first “hit” resulting from a quick search identified an interest survey developed by Scholastic, Inc. Two excerpts from this survey are shown in Figure 1. (http://www.scholastic.com/content/collateral_resources/pdf/student_survey.pdf)

Figure 1. Excerpts from a Commercial Student Interest Survey

Student Interest Survey
Please print as neatly as possible!

Name: ____________________________ Birthday: ____________________________

Adults who live with me:
Name ____________________________
Name ____________________________

Brothers and sisters:
Name ____________________________ Age ____________________________
Name ____________________________ Age ____________________________
Name ____________________________ Age ____________________________
Name ____________________________ Age ____________________________
The second “hit” in the search list was a locally developed student interest survey from Union County Schools, South Carolina. An excerpt from this survey appears in Figure 2.
(http://www.union.k12.sc.us/ems/Teachers-Forms--Student%20Interest%20Survey.htm)
These two examples demonstrate that interest surveys are not complex instruments, yet they can provide a useful “context” for your classroom instruction. This will undoubtedly spark greater interest and engagement on the part of your students as they connect more deeply and personally with your instruction. Additionally, surveys provide an opportunity to get to know your individual students much better. Furthermore, surveys may enable you to identify “patterns” or “themes” across groups of students in a section of a course or across the entire course. Knowledge of these themes can help you to plan instructional activities that capitalize on interests shared by groups of students.

**Career Interest Measures**

Measuring career interests can also prove beneficial for connecting the instructional process to learning. This may be especially true in career and technical education (CTE). Most students have limited knowledge of the diversity of jobs within a particular career field. For example, students may typically think of careers in medicine as being limited to doctors and nurses. However, careers in the medical field also includes therapists, technicians, medical assistants, medical records specialists, nursing assistants, geriatric care providers, and administrative professionals; the diversity of careers in medicine is growing—seemingly every day. Therefore, it is important to survey students’ career interests and then match them to multiple career possibilities, as well as find ways to expose students to a variety of career options that require related interests and abilities.

Given the breadth of careers and related skills, it is most convenient to use commercially available career interest surveys. These surveys ask students numerous questions related to specific skills and...
tasks that they enjoy performing and/or personal qualities that they would use to describe themselves. The result obtained can aid in identifying broad career areas or paths that might be appropriate based on the nature of the student’s responses across the entire instrument.

One example, Student Interest Survey for Career Clusters™, comes from the National Association of State Directors of Career Technical Education Consortium (NASDCTEc) (http://www.careertech.org/career-clusters/ccresources/interest-survey.html). According to the website:

The Student Interest Survey for Career Clusters™ is a career guidance tool that allows students to respond to questions and identify the top three Career Clusters™ of interest based on their responses. This pencil/paper survey takes about fifteen minutes to complete and can be used in the classroom or for presentations with audiences who have an interest in career exploration. The survey is available in English and Spanish.

The survey provides 16 boxes, each containing a list of:

• activities that describe what a student likes to do
• personal qualities that describes a student
• school subjects that the student likes

Students are instructed to circle the items in each box that best describes them. They may circle as many or as few items as they choose. They then total up the number of circles in each box. The three boxes with the highest totals are used to identify possible career clusters that the student may want to explore. An excerpt from the survey appears in Figure 3.
Career interest surveys are a guidance tool to generate discussion and exploration on the part of the student. By no means do the results delineate a specific career the student should enter. Choosing an appropriate career pathway or area of interest is a decision based on a multitude of factors.

**Learning Styles**

Perhaps the most effective strategy for truly "customizing" instruction in order to meet the diverse needs of your students is by understanding their individual learning styles. It is absolutely crucial to remember that students learn differently! To be effective facilitators of learning for every student, teachers need to incorporate a variety of learning strategies. By doing this, you are more likely to help each student learn and will also be creating more interesting and engaging instruction. When examining short teaching strategies that can be used in daily lessons to increase rigor and relevance, it is helpful to analyze each strategy in terms of its relationship to learning styles.

Learning styles can be divided into two categories: sensory mode and thinking mode. Sensory mode describes the preference that some students have for using the senses they are most comfortable in order to acquire new knowledge. The common learning style categories of the sensory mode are visual, auditory, tactile, and kinesthetic learning. Table 1 shows the relationships between each short rigorous/relevant (R/R) strategy and these four sensory modes of learning. Descriptions of these strategies can be found in *Effective Instructional Strategies—Quadrant D Moments*, published by the International Center for Leadership in Education.
Table 1. Relationships between R/R Strategies and Sensory Modes of Learning

<table>
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A second aspect of learning styles is the preferred **thinking mode** that students use to process new knowledge. Two common dimensions of thinking modes (Gregorc) are the concrete-abstract continuum (i.e., whether students rely more on concrete thinking or more on abstract thinking) and the sequential-random continuum (i.e., whether students are more sequential or more random in their thinking). There are four possible combinations across these dimensions:
• **Concrete-Sequential** learners are well organized, enjoy recalling and constructing correct responses, and are consistent and focused in learning.

• **Abstract-Sequential** learners are analytical thinkers, follow traditional instruction, and are comfortable working alone and giving long answers.

• **Concrete-Random** learners respond to opportunities to be creative and design products, are usually self-directed, and like to experiment.

• **Abstract-Random** learners respond to creative learning activities, prefer working with others in a collaborative environment, and are frequently difficult to keep on task.

The relationships between the various short strategies and these thinking preferences are shown in Table 2.
Table 2. Relationships between R/R Strategies and Thinking Preferences

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<th>Concrete Sequential</th>
<th>Concrete Random</th>
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Multiple Intelligences

Howard Gardner's multiple intelligence theory has become a classic model by which to understand many aspects of human intelligence. **Multiple intelligences** refers to the innate traits individuals use to acquire new and different knowledge and skills. These intelligences explain why individuals may show strong interest and increased ability to learn certain things. Gardner has identified nine such intelligences:

- **Verbal/Linguistic** – naturally good with writing or speaking and memorization
- **Logical/Mathematical** – driven by logic and reasoning
- **Visual/Spatial** – good at remembering images and aware of surroundings
- **Bodily/Kinesthetic** – love movement, good motor skills, and aware of their bodies
- **Musical** – musically gifted; a "good ear" for rhythm and composition
- **Intrapersonal** – adept at looking inward
- **Interpersonal** – good with people and in social interactions
- **Naturalist** – sensitivity to and appreciation for nature; and
- **Existential** – ponder, question, and think about “big picture” and mysteries of life.

Some psychologists debate the physiological existence of different intelligences. Nonetheless, awareness of these intelligences and relating them to the strategies (see Table 3) can help teachers recognize how students will respond to and engage with these strategies. Knowledge of them can also help identify situations in which some students will need more time or assistance to learn.
### Table 3. Relationships between R/R Strategies and Various Intelligences

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A Word about Multiple Measures
Whenever schools collect data or other information about students for the purpose of making decisions—regardless of the nature of those decisions—it is important to have an adequate sampling of data. The concept of multiple measures is not new; educators have used them for decades to assess academic learning. For example, if we wanted to know whether our students understand the Pythagorean Theorem, we would not give them only one problem assessing knowledge and application of the Pythagorean Theorem. Rather, we would provide numerous problems to assess their understanding. These problems might be different from one another or variations on similar problems. Regardless, the results would provide an adequate sample to make an accurate decision regarding the learning of our students.

When making any decision about students, incorporating multiple measures is critical. Just as critical is triangulation, the process of using multiple measures and interpreting the results in order to make decisions that are much more valid than decisions based on one source of information. For example, if a student who is studying the Pythagorean Theorem tells us that she understands the theorem, do we automatically assume that she is correct and award her an ‘A’? Absolutely not! We would also want her to demonstrate to us that she understands the mathematics behind the theorem by formally assessing her on her knowledge and application of it. This would result in several measures that we would triangulate.

A Scenario
Jonathan Jones teaches 10th grade biology in an urban school. He’s been teaching for six years, but still feels he struggles to connect with his students and engage them in his lessons. During a recent department meeting, Lisa Madison, the chemistry teacher, said that she had a similar concern several years ago. She shared that she took time to try to get to know her students better: what kind of music they enjoyed, what TV shows they watched, and what they liked to do in their free time. She suggested that this would be a good starting point for him to try to connect better with his classes.

During his planning period the next day, Jonathan began developing a strategy for getting to know his students better. He decided to find out what kinds of things interested them and also what careers they might be interested in pursuing. Since biology encompasses so many potential careers, he thought that if he could identify even a subset of students who might be considering pursuing science as a career, he might be able to use that to his advantage and create a higher level of engagement across all of his classes.

Jonathan began by searching the Internet for student interest surveys that he could use for his own purposes and students. He found five examples that he liked and collected them in a file folder. He also looked for career interest surveys online and came across the Student Interest Survey for Career Clusters™. He liked this instrument for several reasons:
- it did not take long to administer
- it seemed comprehensive in addressing numerous career categories
- with the diversity of careers represented, he figured every one of his students could identify at least one category as a potential future careerpath

Jonathan decided to use that survey for career interest. He was unable to find one student interest survey that was just right, but there were aspects of all five surveys that he wanted to use. So he created his own customized interest survey. Since both instruments were relatively brief, he decided to
administer both on the same day. Although it meant losing one day of instruction, he believed the investment of time would be well worth the potential payoff.

When Jonathan compiled the results, to his surprise, he found that about half of his biology students fell into one of two career clusters:

- Science, Technology, Engineering, and Mathematics
- Health Science

This information proved exciting, because Jonathan knew he could begin to discuss ways in which studying biology could contribute to those career fields. Additionally, numerous students expressed an interest in pursuing Information Technology. Overall, about 75% of his students indicated they wanted to pursue careers in one of those three fields.

Jonathan began to collect resources about specific careers within those three broad categories to share with his students. More importantly, he also began to restructure his lessons so that they incorporated examples of and references to workplace applications of the knowledge and skills that he was teaching. He also tried to find ways to incorporate the hobbies and other information that students had shared in the survey on interests.

This was the “educational break” that Jonathan was hoping for. He firmly believed that sharing things related to his students’ interests—within the context of his biology class and their course of study—would get them more engaged in his class every day. He planned to share his experience at the next department meeting.
KEY POINTS

• Information to help you to get to know your students better include:
  ✓ student demographics
  ✓ interest surveys
  ✓ career interest inventories
  ✓ learning styles

• Knowledge of student demographics can help you design instruction in order that capitalizes on the characteristics of your school population. Some important demographics include:
  ✓ race
  ✓ ethnicity
  ✓ disability status
  ✓ SES
  ✓ home language
  ✓ number of English language learners
  ✓ number of students with IEPs
  ✓ attendance and behavioral referrals.

• Interest surveys are a quick and easy way for you to learn about things that interest your students. You can use commercially developed surveys or develop you own.

• Career interest surveys help students identify skills and qualities that lend themselves to particular career paths. There are numerous commercially-available career interest measures. They should be used only as a tool for discussion and exploration.

• Knowledge of students’ career and personal interests enables you to connect instruction to things that will grab their attention.

• Knowledge of the learning styles and multiple intelligences represented by your students can enable you to structure instruction, practice, reinforcement, and assessments in order to capitalize on them.

• Using multiple measures is important in education. Multiple measures result in more adequate sampling so that decisions are more accurate, reliable, and valid.
References
Chapter 2

Are You Measuring What Matters?

In recent years, conversations about school improvement have stressed “data-driven” instruction. This is a positive step toward more analytical, evidence-based, and objective decision making by measuring the results of instructional effort. Unfortunately, the emphasis on data-driven has often resulted in data-driven test rehearsal, where “teaching” becomes test preparation with students practicing those test questions they have answered incorrectly in practice tests. This is a misplacement of effort on two levels. First, data is often based on limited measures. Secondly, a written test of recall becomes the primary definition of success.

The shift to college and career readiness requires multiple data measures that triangulate students’ actual achievement and growth in learning. Gauging college and career readiness requires using more achievement measures than the results on a test taken on one day. Further, schools need to use performance-based assessment extensively, where students demonstrate not just their knowledge but also their skills in applying the knowledge.

In *Measuring What Matters*, Mike Schmoker states that while data-driven decisions have positive consequences in many schools, “it has morphed into an unintended obstacle to both effective instruction and an intellectually rich, forward-looking education.” He believes that data-driven decisions must help students with 21st century skills through authentic learning rather than only through standardized test driven data. Schmoker recommends looking at the New York Performance Standards Consortium, which is using data for authentic project-based learning (Schmoker).

State assessments in English language arts and mathematics focus entirely on the knowledge and skills outlined in standards. Of course, it is absolutely critical that students master the content to meet the standards; however, research indicates that many other student attributes are critical for success in higher education (Conley).

A fundamental question that teachers need to ask is whether their school is truly measuring what matters. Often, we measure what is convenient, such as recall of facts on a multiple-choice state test, rather than what is important, such as student understanding as demonstrated through a research project and presentation. Measurement drives instruction! When that measurement is limited to a single assessment, it results in limited instruction — and ultimately limited evidence for important decisions about students. When that measurement is broad, it supports a rich and diverse learning environment. Good measurement will drive good decisions about teaching and learning.

States have standard measures that may be part of a school report card and an accountability system. These are often are limited to convenient statewide tests. Schools need to pay attention to these accountability measures, but not be limited by them. Educators need to make a concerted effort to agree on broad ways to measure student growth and success that reflect the school community’s core beliefs about student learning and college and career readiness.
There is growing public interest in better measures of student performance beyond simply reading and mathematics (People for Education). One such initiative that can help schools achieve this broader measure of student success is the Learning Criteria for 21st Century Learners. This valuable tool identifies four broad areas of a student’s experience in school: Foundation Learning; Stretch Learning, Personal Skill Development and Learner Engagement. These four areas, when taken together and used wisely, provide guidance for staff and leadership teams to define multiple measures and craft learning opportunities that prepare students for success in their school careers and beyond.

**Foundation learning** is described as that content and those skills a school or district requires all students to achieve. Taken at its most fundamental, foundation learning is the knowledge which is assessed on standardized tests. Student performance is expressed in objective terms and often related to meeting state accountability benchmarks. Some schools may choose to add other requirements to their definition of foundation learning. In these cases, this criterion might also encompass the beliefs and values of the community in which the school operates. Examples include requiring all students to be involved in the performing arts or to learn a second language.

**Foundation Learning**

**Sample Data Indicators**

- Percentage of students meeting proficiency level on state tests (required)
- Average scores on ACT/SAT/PSAT
- Achievement levels on standardized tests other than state exams
- Percentage of students requiring English/math remediation in college
- Follow-up surveys on academic achievements of graduates
- Percent of students graduating high school in four years
- Percent of students earning college degree within four years
- Military ASVAB score

**Stretch learning** is characterized by students having and taking opportunities for rigorous and relevant learning beyond the minimum requirements identified in foundation learning. When students are “stretched,” they are encouraged to take part in interdisciplinary activities and competitions, to enroll in honors courses, to pursue career majors, or to satisfy the requirements for specialized certificates. Opportunities will vary depending on the school or district situation. An urban school might create more connections with business for internships. A school in a college town might develop a blended curriculum for its students. The extent to which students take advantage of these opportunities is considered “stretch.”
Stretch Learning
Sample Data Indicators

• Number of credits required to graduate

• Average number of credits earned at graduation

• Interdisciplinary work and projects (e.g., senior exhibition)

• Participation/test scores in International Baccalaureate courses

• Average number of college credits earned by graduation (dual enrollment)

• Enrollment in advanced math or science courses

• Enrollment in AP courses/scores on AP exams/percentage achieving >2

• Percent of students completing career majors or CTE programs

• Four or more credits in a career area

• Four or more credits in arts

• Three or more years of foreign language

• Value of scholarships earned at graduation

• Achievement of specialized certificates (e.g., Microsoft, Cisco Academy)

**Personal skill development** describes those characteristics that prepare students for lifelong success. They include personal and social skills such as organization, goal setting, controlling emotions, and empathy. Also included are leadership skills, collaboration, and teamwork. Personal skill development is characterized by social and emotional growth. In short, this dimension focuses on the skills needed to succeed at home, in business, and in the community as an adult.

**Personal Skill Development**
**Sample Data Indicators**

• Participation or hours in volunteer work or service learning

• Students holding leadership positions in clubs or sports

• Assessment of personal skills: time management, ability to plan and organize work, leadership/followership, etc.

• Respect for diversity

• Working as a member of a team

• Trustworthiness, perseverance, other character traits

• Conflict resolution

• Reduction in number of student incidences of conflict

• Follow-up survey of graduates on development of personal skills

**Learner engagement** is the overarching dimension of the Learning Criteria. It is both the prerequisite and the unifying theme for achieving career and academic success. When learners engage with their teachers, peers, and school community, they are intrinsically motivated. They exhibit positive behaviors and participate in the learning process. They have a sense of satisfaction, belonging, and accomplishment. The learner feels safe and secure. He or she is motivated to learn actively and well — in the moment and for the future.
Learner Engagement
Sample Data Indicators

- Student satisfaction surveys
- Student risk behaviors (asset survey)
- Dropout rate
- Attendance rate
- Graduation rate
- Discipline referrals
- Participation rate in extracurricular activities
- Follow-up survey on enrollment in higher education

- % of students taking ACT/SAT
- Tardiness rate
- Surveys on degree to which teachers know their students
- Surveys on positive peer relationships
- % of students going to two-year colleges
- % of students going to four-year colleges

How the Learning Criteria Was Created
In 2005, the Successful Practices Network, in partnership with the International Center for Leadership in Education and the Council of Chief State School Officers (CCSSO), and with support from the Bill & Melinda Gates Foundation, embarked upon a five-year initiative to identify, analyze, enrich, and disseminate the nation’s most successful school-wide practices and policies for achieving a rigorous and relevant curriculum for all students, with a particular focus on classroom instruction and effective learning (Lucey, et al.). Among the required outputs of this initiative were comprehensive criteria to identify and evaluate high schools based on student achievement and other measurable data; and to identify and monitor promising models of success that represented a variety of approaches and instructional and curricular philosophies. What emerged to guide this five-year project was the Learning Criteria.

The specific data indicators used will vary among schools based upon state requirements and school philosophy, focus, and curriculum. To identify success and maximize its usefulness, data collected through the Learning Criteria tool must be examined from the following perspectives:

- **School Performance** – Expressed in objective terms
- **Sustained** – Trend data to show improvement or maintenance at high levels for 3-5 years
- **Disaggregated** – Comparisons in achievement among all subgroups
- **Benchmarked** – Compared to similar schools, other schools in the state, schools in the nation or accepted norms from national/state reports.


## KEY POINTS

- Discuss with representative groups of community, parents, students, and staff the best measures of student success which reflect beliefs and goals of the school.
- Establish systems to record data in the selected measures.
- Identify and share current levels of student performance.
- Set short- and long-term goals for student measures.
- Communicate the Learning Criteria measures widely.
- Analyze data annually, examine trends, disaggregate data on subpopulations, compare to benchmarks, and revise goals.
A Scenario

Principal Ann Murray had just completed reviewing her high school’s state report card. The results were mixed. Her biggest concern was that the school was still not making significant progress in increasing the number of students rated proficient in English language arts and mathematics. Addressing this lack of achievement by a large number of students had been one of her priorities beginning with her appointment as principal two years ago. In spite of a lot of effort in identifying the at-risk students and providing various interventions, improvement was minimal.

There was much to be proud of in the school. Attendance was excellent. There were few dropouts, and morale among staff and students was very high. The school offered a number of advanced courses and dual credit options, and many students pursued postsecondary education. But Principal Murray was still concerned about the stagnant performance on state accountability measures.

She decided to take a new approach. She met with her Data Planning Team to consider focusing the discussion on more than state test scores. She acknowledged that the team was getting discouraged by her constant focus on basic scores that still didn’t seem to improve. After sharing the current data, she stated that they were going to focus on more than these limited measures of student success. The team spent the rest of the meeting discussing how they would describe a well-educated and career-ready student. Using those characteristics, the team members identified ways in which they already had quantified — or could quantify — student growth, attainment, achievement, and “readiness.” They discussed the increasing percentage of students who were taking advanced courses. They talked about the positive student climate and the lack of discipline problems or issues. They also discussed the large number of students who were completing CTE programs and engaging in work-based learning, which opened up possibilities for students to pursue an education and a career that they were excited about.

In all, the team identified a dozen measures of student achievement that they termed the Student Indicators of 21st Century Learning. Over the next two months, they shared the data measures with the entire staff and with parents. There was strong support for these multiple measures, which triggered many favorable comments. Parents were happy to see the school focused on the whole child, and many teachers could see how their efforts fit into these new measures of achievement. Some of the measures were not quantified, so Principal Murray met with the guidance department to add elements to their data system regarding students’ credits and achievement in their transcript. As a result, the school able to display a comprehensive picture of a student’s total education experience.

The move to multiple measures of achievement energized staff. They celebrated their achievements, but more importantly, identified areas in which they could improve. They began to recognize that they weren’t serving all students adequately in the variety of programs. For example, some students — particularly students from poverty — were being discouraged from taking more advanced courses or earning college credits while still in high school. Likewise, not all students were encouraged to include CTE in their high school experience. There were also discussions in which some students revealed that they felt there weren’t clubs or activities in which they could — or chose to — participate. This led to the creation of several new organizations, clubs, and extracurricular activities. These changes resulted in positive energy for school improvement.

The data went beyond being just a means to complement what many people perceived as a very good school. It was an honest effort to look broadly at measures of student achievement and how they could raise the aspirations for all students.
At the end a year, the school not only had made greater improvement in the accountability measures in mathematics and English language arts, but also was making progress in several different measures of student achievement. The staff were proud of their accomplishments, and parents and the community were very encouraged by the data. They now had a broader array of data to describe their school. Principal Murray was able to show progress in providing outstanding opportunities for all students and better preparation for college and career. She could honestly say the school was measuring what mattered and describing in quantitative terms what it meant to be a well-educated and career-ready student.

References


How Can You Tell What Your Students Aren’t Learning
and What Do You Do Once You Know That?

Today’s educational climate has necessitated a change in the types of responsibilities faced by teachers and administrators alike. Although mastering the “art of teaching” remains part of a critical skill set, today’s teachers must also understand and practice the “science of teaching.” The “old tools”—intuition, teaching philosophy, and personal experience—are simply not enough anymore (LaFee). It has become crucial that teachers and building administrators understand the importance of—and how to make—data-driven instructional decisions (Mertler, in press; Mertler & Zachel).

Data-driven decision making is a process by which educators examine the results of standardized tests and other assessment data in order to identify student strengths and deficiencies, with the ultimate goal being a critical examination of their curriculum and instructional practices relative to their students' performance on standardized tests and other forms of assessment (Mertler, 2007). This, in turn, provides educators with another level or type of information to help them make instructional decisions that are more accurately informed. In other words, these decisions are, at least in part, guided by student performance on state, as well as national, assessments of learning (Mertler & Zachel). However, “localized” summative assessments (such as tests, performance-based assessments, portfolios, etc.) and formative assessments (such as quizzes, homework, teacher observations and questions, and student reflections) are also legitimate and viable sources of student data for this process.

When examining assessment results from standardized tests or local assessments for the purpose of revising instruction, the most common practice is to interpret the results for an entire class or course (Mertler, 2002; Mertler & Zachel). These results may come from a class or group report obtained from a testing company or from an informal item analysis of a local assessment. This information allows the teacher to see how students are performing as a whole.

On standardized end-of-year tests, areas in which a large proportion of students are deficient may be identified following the process shown in Figure 1 (Mertler, 2002; 2007). It is important to note that this process is focused on group-level instruction and the instructional improvements will likely be for next year’s—or next term’s—instruction. In other words, after you learn which aspects of your instruction are not working as effectively as you would like, you revise your instruction for the next time you teach this particular content or skill.
Figure 1. Steps in a Generic Process for Identifying Areas in which Students Are Deficient (focusing on whole group results)

1. Identify any content areas or subtests where there are high percentages of students who performed below average.
2. Based on these percentages, rank order the content areas or subtests with the poorest performance.
3. From this list, select 1–2 content areas to examine further by addressing the following:
   - Where is this content addressed in our district’s curriculum?
   - At what point in the school year are these concepts/skills taught?
   - How are students taught these concepts/skills?
   - How are students required to demonstrate that they have mastered the concepts/skills? In other words, how are they assessed in the classroom?
4. Based on the answers to the questions above, identify new/different methods of instruction, reinforcement, assessment, etc.
It is very important to note that the **criterion** for determining that which defines “deficient academic performance” will vary—perhaps greatly—by teacher, by classroom, by subject area, and by school or district. Ultimately, it is up to the individual teacher (or, perhaps more appropriately, collaborative grade level teams, subject areas, or perhaps even entire school buildings) to determine some sort of system for determining the level of student performance on any given assessment which that will distinguish between “acceptable” and “unacceptable” performance.

When it comes to determining which subtests or skills will be targeted for curricular or instructional revisions, on some tests or in some classes it may be those on which more than 10% of students performed at an unacceptable level. In another course or on another standardized test, it may be determined that content on which 50% of students performed below the self-determined “standard” will be the focus of revisions.

This generic approach provides a systematic, step-by-step—and arguably more scientific—process for educators to follow in reviewing standardized test results. It is viewed as “generic” in that it can reasonably and effectively be applied to any situation, regardless of grade level, subject matter area, type of instruction, or types of skills being taught. Equally important to note is that all of the steps outlined in Figure 1 should be followed in order to clearly see the nature of possible relationships between student performance and the curriculum and/or instructional practices (Mertler, 2007). These relationships may be influenced by things such as when a particular unit or skill is taught during the school year (i.e., where it falls in the scope and sequence of the entire curriculum), how the material is taught, how it is reinforced or practiced, and how student mastery of the material or skills is assessed.

The first step in this process is the identification of any content areas or subtests (as well as any specific types of skills) where there are high percentages—as determined by those directly involved—of students who performed below average (in the case of **criterion-referenced scores**) or where group performance is low in relation to the **norm group** (in the case of **norm-referenced scores**, by examining **percentile ranks** or **stanine scores**). Secondly, the identified content areas or subtests should be rank-ordered, with number 1 on the list being the area with the poorest level of student performance.

The third step is to “flag” one or two specific content areas with the poorest performance for further examination and to serve as the focus for any curricular or instructional revisions. As part of this closer examination, it is strongly recommended that teachers address the questions listed in Figure 1:

1) Where is this content addressed in our district’s curriculum?
2) At what point in the school year are these concepts/skills taught?
3) How are students taught these concepts/skills?
4) How are students required to demonstrate that they have mastered the concepts/skills? In other words, how are they assessed in the classroom?

Note the high degree of **professional reflection** built into these four questions. Answers to these questions, as well as others that will undoubtedly arise during the process, can provide important information that will ultimately guide decisions regarding instructional revisions. The specification of these revisions—which might consist of such things as the identification of new or different methods of instruction, incorporation of new supplemental materials or activities, reorganization of the sequence of instructional topics, or development of different types of classroom assessments—constitutes the final step in the process.
A word of caution is in order. Generally speaking, most standardized tests are intended to survey basic skills across a broad domain of content (Chase). On most standardized tests, a specific subtest may consist of as few as 5 items. Careless errors or lucky guesses by students may substantially alter the score on that subtest, especially if the scores are reported as percentages of items answered correctly or as percentile ranks. Therefore, it is important to examine not only the raw scores and percentile ranks, but also the total number of items on a given test prior to making any intervention decisions (Mertler, 2007).

Most publishers of standardized tests provide both criterion-referenced and norm-referenced results on individual student reports. Many results are reported in terms of average performance (i.e., below average, average, above average). Again, it is important to remember that “average” simply means that half of the norm group scored above and half scored below that particular score. Teachers and administrators should take great care to avoid over-interpretation of test scores (Russell & Airasian). An example of group-level decision making follows (Mertler, 2007).

**Example of Group-Level Decision Making – A Scenario**

David Alvarez is an 8th grade math teacher. He was initially quite pleased with the score report from his class’s performance on the statewide mathematics achievement test. The average scaled score of 412 was well within the “Proficient” range, equal to the state average, and only slightly below that for the entire school and district. In addition, only 21% of his students scored below the “Proficient” performance level, which was a smaller than the percentages for the school, district, and state. However, he knew that he needed to examine the results more closely, since it was apparent that there was still room for his students to improve.

The mathematics test is broken down into five strands, and David examined them next. Nearly one-third (30%) of his students were “Below Proficient” on the Numbers, Number Sense, and Operations strand. While this performance concerned him, he wanted to examine the results for all strands and put them in an appropriate context prior to making any decisions. His students’ performance on the Measurement strand was really quite good, with only 4% “Below Proficient.”

About one-fourth (26%) of his class did not meet the standard for Geometry and Spatial Sense, which was partially demonstrated in the results for released items. However, he was not as concerned as he might have been, because his class still outperformed the rest of the school, district, and state. He felt that this could be an area on which to focus some instructional revisions, but, at this point, it might not be the most critical area. Similarly, while there was still room for improvement on Patterns, Functions, and Algebra, his students performed better than the comparison groups. Again, he decided to hold off on making a decision about this strand.

The fifth strand, Data Analysis and Probability, had worried David even before he looked at the results. His unit on data analysis and probability typically fell late in the school year in the instructional sequence of topics. Often, he would teach it just prior to, and sometimes just following, the administration of the state achievement tests. His students never seemed to do very well on it, even though it was content that he really enjoyed teaching and on which he believed he did a good job. He sometimes thought that he was not giving the students a “fair opportunity” to do well on this strand. When he examined the test results, his prior beliefs had been confirmed. Students had difficulties with all three of the released items, and 22% scored below the “Proficient” level.
Although his class’s performance indicated the need for some additional attention or instructional revisions on several of the strands, David decided to focus on making some changes to his data analysis and probability unit, not only because of the test results, but also based on his experiences over the past several years. He decided to revise the order in which he taught several of his units and to move data analysis and probability up several weeks, so that during the next school year, he would teach it as the first unit in the second semester. Of course, some other content would be “pushed back” to the spring, closer to the test administration. He knew that he would have to examine next year’s test results taking this data into consideration.

**KEY POINTS**

- Data-driven decision making is a process by which educators examine the results of student assessments in order to identify strengths and deficiencies.
- The ultimate goal is to examine critically all aspects of the instructional process so that decisions are more accurately informed.
- Standardized, as well as localized, assessments are viable sources of student data for this process.
- Examination of standardized test results makes use of class or group reports.
- Examination of localized assessment results utilizes an informal item analysis. The process involves:
  - Identifying content of subtests where high percentages of students performed poorly.
  - Rank ordering those content areas or skills.
  - Identifying 1 or 2 of those to focus on by examining specific aspects of that instruction.
  - Identifying new/different methods of instruction, reinforcement, assessment, etc.
- This process can be applied to any grade level, subject matter, type of instruction, or skills being taught.
- Professional reflection is an integral part of the process.
- The focus of this decision-making and improvement process will be on the next time the particular content or skills are taught.
References
Once You Know Who Is Not Learning, How Can You Help Individual Students?

In addition to providing structure and helping to guide decisions about group instruction, student assessment data may also be used effectively to assist in the development of individualized intervention strategies. However, it is important to remember that, generally speaking, standardized tests—including achievement tests—survey basic skills across a broad domain of content. The performance of an individual student on any given subtest should be interpreted with caution, because that subtest may consist of only a handful of items and therefore not reveal the full array of the student’s knowledge of the topic.

On a subtest with five items, for example, a student may answer three of the items correctly and perhaps be careless in responding on one item and omit another one. This student’s “proficiency” on that content would be reported as 60%, which most educators would initially interpret as poor understanding or mastery. Of course, we likely do not know why one item was missed (a careless mistake or not?) and the other omitted (did the student inadvertently skip the item or not understand the material at all?).

This result also holds true for classroom assessments (e.g., larger unit tests, final exams, or comprehensive projects). Teachers must be aware of the potential for careless errors—as well as lucky guesses—made by students that might substantially alter their score on a particular subtest, especially if the scores are reported as percentages of items answered correctly, as percentile ranks, or if the number or items answered correctly is used to categorize student performance (e.g., into classes such as “below average,” “average,” and “above average”).

Therefore, it is important to examine not only raw scores, percentile ranks, and the like, but also the total number of items on a given test prior to making any intervention decisions (Mertler, 2003). Consideration of these circumstances is especially crucial when examining the test results of individual students for purposes of designing instructional intervention strategies. It is important that teachers and administrators exhibit great care in order to avoid the over-interpreting—in other words, reading too much into—an individual score for an individual student. This may lead to an erroneous over-generalization of student mastery or deficits.

The process for examining assessment results in order to aid in the decision making relevant to the development of intervention strategies for individual students is shown in Figure 1. Similar to the process for guiding instructional revisions for large group instruction, this process can be applied to a wide variety of situations—grade levels, subject matter areas, types of instruction, types of skills being taught. The general process provides a systematic, step-by-step—and arguably more scientific—approach for educators to follow when developing individualized interventions. The major difference between this process and the one focused on instructional revisions for large groups is that these instructional revisions are focused on the current year—i.e., immediate interventions.
This process begins by identifying—from test reports or results of student assessments—any content, skill, or subtest areas on which the student performed below average (or poorly, but not necessarily below average). It is very important to note that the criterion for determining that which defines “deficient academic performance” will vary—perhaps greatly—by teacher, by classroom, by subject area, by school or district, or even by the individual student who is the focus of the intervention. Ultimately, it is up to the teacher (or grade level or subject areas team) to determine a system for determining the level of student performance on any given assessment that will distinguish between “acceptable” and “unacceptable” performance.

If more than one area of weakness or deficiency is identified for the student, the areas should be ranked in order of the perceived severity of the deficiency. The one or two highest-ranked areas should then be selected to serve as the focus of the intervention. Finally, new or different methods of instruction, reinforcement, and/or assessment should be identified, developed, and implemented in order to meet the needs of the student (Mertler, 2007). An example of student-level decision making follows

**Example of Student-Level Decision Making – A Scenario**
Mikayla Johnson’s first grade class, on the whole, had been doing quite well in all tested areas of reading on both the benchmark assessments and on monitoring assessments of the district-adopted standardized reading test. However, student Myles Smith seemed to be struggling with some aspects of reading. He was strong in Phonemic Awareness, having surpassed the target in the December benchmark assessment. Similarly, he met the target score for Alphabetic Principle in April. Nevertheless, he was experiencing some difficulty in the area of Oral Reading Fluency. He scored slightly below the target in December and did not show any improvement in the April assessment. Because the target goal had increased in April, essentially, Myles was actually “regressing” in terms of his oral fluency skills with respect to the targets, as outlined by the assessment.
Mikayla knew that Myles was in need of some individualized interventions in order for him to progress toward the grade-appropriate goals. She decided to implement weekly oral reading fluency interventions to provide continuing reinforcement of fluent reading skills. In addition, she decided to check John’s ability to recognize “sight words” in order to see if that was an area in which he might also need remediation. If this was the case, she knew that helping him improve his sight word recognition would also increase his oral fluency.

**KEY POINTS**

- Student assessment data can be used effectively to assist in the development of individualized intervention strategies.
- Like the process for large-group instruction, this process can utilize the results from both standardized and localized assessments.
- The process involves:
  - Identifying content of subtests where a particular student performed poorly.
  - Rank ordering those areas or skills in terms of the poorest performance.
  - Identifying 1 or 2 areas to serve as the focus of the intervention.
  - Identifying new/different methods of instruction, reinforcement, assessment, etc. in order to meet the needs of the individual student.
- This process can be applied to any grade level, subject matter, type of instruction, or skill being taught.
- Professional reflection is an integral part of the process.
- The focus of this decision making and improvement process is on immediate interventions strategies.

**References**


How Do You “Grade” Student Work on Performance Assessments?

Performance Assessments

Often, the types of assessments used in classroom settings—along with the information and decisions that result from them—focus narrowly on comprehension skills. In other words, these assessments help teachers answer the question: What do my students know? Although teachers are concerned about what students know, they should also be interested—and, in many instances, more interested—in whether students are capable of using what they know. This dichotomy represents the difference between simply knowing something and being able to apply it, preferably in a real-world context. This focus on a different result requires the use of different forms of assessment; the same techniques used to assess knowledge and comprehension will not suffice when trying to assess actual student capabilities. Performance assessments permit teachers to assess these types of capabilities (Mertler, 2003).

Performance assessments present students with a hands-on task or some other performance-based activity that they must complete, either individually or in a small group. Performance assessments use specifically-defined and pre-established criteria for evaluating the work done by students (Nitko). Therefore, performance assessments consist of two components: (1) the performance task and (2) the pre-established scoring criteria, usually in the form of a scoring rubric.

- A performance task is the actual prompt or activity supplied to students as part of a performance assessment; it specifies exactly what they are to do.
- A scoring rubric is a scoring guide, consisting of specific pre-established performance criteria, used in evaluating student work on performance assessments (Mertler, 2003).

Performance assessment permits the direct observation of student skills and capabilities. In other words, the results of performance assessments provide teachers with information about the extent to which students are capable of applying specific knowledge or executing a specific set of skills. This is dramatically different from the information that results from more traditional pencil-and-paper tests. The latter typically assesses the extent to which students recall and/or understand facts and concepts and, perhaps, know how to execute a set of skills. However, knowing how to do something and actually doing it are two different things. For example, a commonplace activity in an automotive technology education class is the disassembly and subsequent reassembly of a small engine. Many students may be able to tell their teacher how to reassemble the engine (in other words, they know how to do it), but it takes a different set of skills and capabilities to be able to actually reassemble the engine. Additionally, if it is important that students be able to put the engine back together (i.e., if it is a specific instructional objective), then the auto tech teacher should not assess the objective merely by asking students to describe how to assemble an engine, but rather having them do it (Trice).

Performance assessments may be used for formative or summative purposes.

- In a formative assessment, the results are used as feedback to students about their learning and feedback to teachers about their instruction. The assessment is administered during the course of instruction.
• Summative assessments are administered at the completion of large units of instruction and are used for administrative-type decisions, such as assigning grades, retention, and academic placement.

It is critical that teachers decide at the outset of an instructional unit whether the results of a performance assessment will be used for formative or summative purposes. This decision impacts the nature of the scoring instrument to be developed, which is our next topic.

**Scoring Rubrics**

Rubrics are rating scales—meaning that there is a continuum of options for rating or scoring student work—that are most often used with performance assessments. They are formally defined as scoring guides, consisting of specific pre-established performance criteria used in evaluating student work on performance assessments. Rubrics are typically the specific form of scoring instrument used when evaluating student performances or products resulting from a performance assessment task. There are two types of rubrics: holistic and analytic (see Figure 1).

- **A holistic rubric** requires the teacher to score the overall process or product as a whole, without judging the component parts separately (Nitko). You might think of a holistic rubric as a type of scoring guide that is used with Olympic figure skating. The judges are looking for a wide variety of technical aspects as well as artistic expression, but the overall result is a single score for the total performance.

- **With an analytic rubric**, the teacher first scores individual parts of the product or performance separately, then sums the individual scores to obtain a total score (Mertler, 2001; 2002; Moskal).
Holistic rubrics are customarily utilized when errors in some part of the process can be tolerated provided the overall quality is high, due to the fact that assessment of the whole product is the focus. Nitko further states that use of holistic rubrics is probably more appropriate when performance tasks require students to create some sort of response and where there is no definitive correct answer. The focus of a score reported using a holistic rubric is on the overall quality, proficiency, or understanding of the specific content and skills—it involves assessment on a unidimensional level (Mertler, 2001). Holistic rubrics can result in a somewhat quicker scoring process than analytic rubrics (Nitko). This is because the teacher is required to read through or otherwise examine the student product or performance only once in order to get a sense of what the student was able to accomplish (Mertler, 2001). Since assessment of the overall performance is the key, holistic rubrics are also typically --- though not exclusively --- used when the purpose of the performance assessment is summative in nature. At most, only limited feedback is provided to the student as a result of scoring performance tasks in this manner. A template for a holistic scoring rubric is presented in Figure 2.
Analytic rubrics are usually preferred when a fairly focused type of response is required (Nitko); that is, performance tasks where there may be more than one acceptable response and where the performance or product may be complex and multi-faceted, necessitating examination of several critical elements— for example, content, language, and presentation. Furthermore, analytic rubrics initially result in several scores, followed by a summed total score; their use represents assessment on a multidimensional level (Mertler, 2001). The use of analytic rubrics can cause the scoring process to be substantially slower, mainly because assessing several different skills or characteristics individually requires a teacher to examine the product several times. Both the construction and use of these rubrics can be quite time-consuming.

A general rule of thumb is that an individual’s work should be examined a separate time for each of the specific performance tasks or scoring criteria (Mertler, 2001). However, the advantage of using analytic rubrics is quite substantial. The degree of feedback offered to students—and to teachers—is significantly greater than through the use of holistic rubrics. Students receive specific feedback on their performance with respect to each of the individual scoring criteria—something that does not happen when using holistic rubrics (Nitko). It is possible to then create a “profile” of specific student strengths and weaknesses (Mertler, 2001). A template for analytic scoring rubrics is presented in Figure 3.
Prior to designing a rubric, a teacher must decide whether the performance or product will be scored holistically or analytically. Regardless of which type of rubric is selected, specific performance criteria and observable indicators must be identified as an initial step to development (Mertler, 2001; 2002). The decision regarding the use of a holistic or analytic approach to scoring has several possible implications. The most important is considering first how you intend to use the results. If an overall summative score is desired, a holistic scoring approach would work well. If formative feedback is the goal, an analytic scoring rubric should be used, due to the level of specificity it provides. It is important to note that one type of rubric is not inherently better than the other—you must find a format that works best for you in a given assessment situation (Montgomery). Other implications include the time requirements, the nature of the task itself, and the performance criteria being observed (Mertler, 2001).

Another type of rubric is the mini-rubric. A mini-rubric is essentially a combination of (1) a checklist and (2) one analytic criterion. The result is a simple, easy-to-use assessment, appropriate for situations when you might want to quickly assess an overall aspect of a project—e.g., progress being made toward

<table>
<thead>
<tr>
<th>Criteria #1</th>
<th>Not demonstrated or unable to be observed</th>
<th>Description reflecting beginning level of performance</th>
<th>Description reflecting movement toward mastery level of performance</th>
<th>Description reflecting achievement of mastery level of performance</th>
<th>Description reflecting highest level of performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria #2</td>
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<td>Description reflecting beginning level of performance</td>
<td>Description reflecting movement toward mastery level of performance</td>
<td>Description reflecting achievement of mastery level of performance</td>
<td>Description reflecting highest level of performance</td>
</tr>
<tr>
<td>Criteria #3</td>
<td>Not demonstrated or unable to be observed</td>
<td>Description reflecting beginning level of performance</td>
<td>Description reflecting movement toward mastery level of performance</td>
<td>Description reflecting achievement of mastery level of performance</td>
<td>Description reflecting highest level of performance</td>
</tr>
<tr>
<td>Criteria #4</td>
<td>Not demonstrated or unable to be observed</td>
<td>Description reflecting beginning level of performance</td>
<td>Description reflecting movement toward mastery level of performance</td>
<td>Description reflecting achievement of mastery level of performance</td>
<td>Description reflecting highest level of performance</td>
</tr>
</tbody>
</table>

**Template for Analytic Rubrics**

Prior to designing a rubric, a teacher must decide whether the performance or product will be scored holistically or analytically. Regardless of which type of rubric is selected, specific performance criteria and observable indicators must be identified as an initial step to development (Mertler, 2001; 2002). The decision regarding the use of a holistic or analytic approach to scoring has several possible implications. The most important is considering first how you intend to use the results. If an overall summative score is desired, a holistic scoring approach would work well. If formative feedback is the goal, an analytic scoring rubric should be used, due to the level of specificity it provides. It is important to note that one type of rubric is not inherently better than the other—you must find a format that works best for you in a given assessment situation (Montgomery). Other implications include the time requirements, the nature of the task itself, and the performance criteria being observed (Mertler, 2001).

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<tbody>
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<td>Criteria</td>
<td>Not demonstrated or unable to be observed</td>
<td>Description reflecting beginning level of performance</td>
<td>Description reflecting movement toward mastery level of performance</td>
<td>Description reflecting achievement of mastery level of performance</td>
<td>Description reflecting highest level of performance</td>
</tr>
<tr>
<td>Total Score</td>
<td>=</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
completion—along with specific formative feedback on a particular criterion. An example of a mini-rubric is shown in Figure 4.

**Figure 4. A Mini-Rubric Example Combining Both Holistic and Analytic Features**

![Fairy Tale Retelling Mini-Rubric](image)

As we saw demonstrated in the templates in Figures 2 and 3, the various levels of student performance can be defined using labels that are either quantitative (i.e., numerical) or qualitative (i.e., descriptive). In some instances, you might want to utilize both quantitative and qualitative labels. If a rubric contains four levels of proficiency or understanding on a continuum, quantitative labels would typically range from “1” to “4.” When using qualitative labels, you have much more flexibility and can be more creative. A c qualitative scale might include the following labels: *master, expert, apprentice, and novice*. Nearly any type of qualitative scale will suffice, provided it “fits” with the task. The following list offers several suggestions for qualitative descriptors (Stix).
Converting Rubric Scores to Letter Grades

For many educators, the most frustrating aspect of scoring student work with rubrics is converting them to “grades.” It is not a good idea to think of rubrics in terms of percentages (Mertler, 2003; Trice). For example, if a rubric has six levels (or “points”), a score of “3” should not be equated to 50% (an “F” in most letter grading systems). The process of converting rubric scores to grades or categories is more a process of logic than mathematics. Trice suggests that in a rubric scoring system, there are typically more scores at the average and above-average categories (i.e., equating to grades of “C” or better) than there are below-average categories. This is because teachers should be trying to differentiate among the higher levels of performance, proficiency, or mastery—which is not what typically happens on a pencil-and-paper test. For instance, if a rubric has nine score categories (i.e., 0–8), the equivalent grades and categories might look like this:

<table>
<thead>
<tr>
<th>Rubric Score</th>
<th>Category</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Excellent</td>
<td>A+</td>
</tr>
<tr>
<td>7</td>
<td>Excellent</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>Good</td>
<td>B+</td>
</tr>
<tr>
<td>5</td>
<td>Good</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>Fair</td>
<td>C+</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>Unsatisfactory</td>
<td>U (D/F)</td>
</tr>
<tr>
<td>1</td>
<td>Unsatisfactory</td>
<td>U (D/F)</td>
</tr>
<tr>
<td>0</td>
<td>Unsatisfactory</td>
<td>U (D/F)</td>
</tr>
</tbody>
</table>
As another example, consider a rubric that utilizes a typical 5-point scale (0–4). Its conversion table might look like this:

<table>
<thead>
<tr>
<th>Rubric Score</th>
<th>Category</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Excellent</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>A-/B+</td>
</tr>
<tr>
<td>2</td>
<td>Fair</td>
<td>B/B-</td>
</tr>
<tr>
<td>1</td>
<td>Unsatisfactory</td>
<td>C/D</td>
</tr>
<tr>
<td>0</td>
<td>Unsatisfactory</td>
<td>F</td>
</tr>
</tbody>
</table>

Of course, if you are using an analytic rubric, you can convert the total score to a percentage if that “fits” with your goals of the assessment and with your personal system of reporting student performance. Also keep in mind is that your options for conversions to letter grades may be limited by school or district policies or if you are utilizing a standards-based grading system.

When converting rubric scores to grades—typical at the secondary level—or to descriptive feedback—typical at the elementary level—it is important to remember that there is not one correct way to accomplish this. The bottom line for teachers is that they must find a system of conversion that works them, fits comfortably into their individual system of reporting student performance, is at least reasonably valid and reliable, and is fair to the students.

**Steps in Designing Your Own Rubrics**

A step-by-step process for designing scoring rubrics for classroom use is presented below, followed by two sample scoring rubrics (Mertler, 2001; Montgomery; Nitko).

**Step 1:** Re-examine the learning objectives to be addressed by the task. This allows you to match your scoring guide with your objectives and actual instruction.

**Step 2:** Identify specific observable attributes that you want to see (as well as those you don’t want to see) your students demonstrate in their product, process, or performance. Specify the characteristics, skills, or behaviors that you will be looking for, as well as common mistakes you do not want to see.

**Step 3:** Brainstorm characteristics that describe each attribute. Identify ways to describe above average, average, and below average performance for each observable attribute identified in Step 2.

**Step 4a:** For holistic rubrics, write thorough narrative descriptions for excellent work and poor work incorporating *all attributes* into the description. Describe the highest and lowest levels of performance combining the descriptors for all attributes.

**Step 4b:** For analytic rubrics, write thorough narrative descriptions for excellent work and poor work for *each individual attribute*. Describe the highest and lowest levels of performance using the descriptors for each attribute separately.

**Step 5a:** For holistic rubrics, complete the rubric by describing other levels on a continuum that ranges from excellent to poor work for *the collective attributes*. Write descriptions for all intermediate levels of performance.
Step 5b: For analytic rubrics, complete the rubric by describing other levels on a continuum that ranges from excellent to poor work for each attribute. Write descriptions for all intermediate levels of performance for each attribute separately.

Step 6: Collect samples of student work that exemplify each level. These will help you score in the future by serving as benchmarks.

Step 7: Reflect on the effectiveness of the rubric and revise it prior to its next implementation.

These steps involved in the design of rubrics are summarized in Figure 5.

**Figure 5. Step-by-Step Procedure for Designing Performance Assessment Scoring Rubrics**

- **Step 1:** Re-examine the learning objectives to be addressed by the task.
- **Step 2:** Identify specific observable attributes that you want to see (as well as those you don’t want to see) your students demonstrate in their product, process, or performance.
- **Step 3:** Brainstorm characteristics that describe each attribute.

**For holistic rubrics...**

**Step 4a:** Write thorough narrative descriptions for excellent work and poor work incorporating all attributes into the description.

**Step 5a:** Complete the rubric by describing other levels on the continuum that ranges from excellent to poor work for the collective attributes.

**Step 6:** Collect samples of student work that exemplify each level.

**Step 7:** Revise the rubric, as necessary.

**For analytic rubrics...**

**Step 4b:** Write thorough narrative descriptions for excellent work and poor work for each individual attribute.

**Step 5b:** Complete the rubric by describing other levels on the continuum that ranges from excellent to poor work for each attribute.
One final important aspect of using a scoring rubric is to be sure that students are aware of the evaluative criteria in advance of actually beginning to work on their performance or product. Since performance tasks tend to be more open-ended, it is crucial for students to have a clear understanding of the criteria upon which they will be assessed well in advance of submitting their work (Mertler, 2003). In this way they will know what constitutes exemplary work.

**Two Scenarios**

Two sample scoring rubrics (Mertler, 2003) corresponding to performance assessment tasks are presented next. A holistic rubric is presented for the first task and an analytic rubric for the second, but either one could have been designed for either task.

**Example 1: Mathematics — Upper Elementary**

Matt Harris, a 4th grade teacher, is planning a unit on data analysis, focusing primarily on the skills of estimation and interpretation of graphs. At the end of this unit, he wants to be able to assess his students’ mastery of the following instructional objectives:

- Students will properly interpret a bar graph.
- Students will accurately estimate values from within a bar graph. (Step 1)

Since the purpose of this performance task is summative and the results will be incorporated into the students’ grades, he decides to develop a holistic rubric. He identifies four attributes on which to focus his rubric: estimation, mathematical computation, conclusions, and communication of explanations (Steps 2 & 3). Finally, he begins drafting descriptions of the various levels of performance for the observable attributes (Steps 4 & 5). Here is his rubric.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Makes accurate estimations. Uses appropriate mathematical operations with no mistakes. Draws logical conclusions supported by graph. Sound explanations of thinking.</td>
</tr>
<tr>
<td>3</td>
<td>Makes good estimations. Uses appropriate mathematical operations with few mistakes. Draws logical conclusions supported by graph. Good explanations of thinking.</td>
</tr>
<tr>
<td>2</td>
<td>Attempts estimations, although many inaccurate. Uses inappropriate mathematical operations, but with no mistakes. Draws conclusions not supported by graph. Offers little explanation.</td>
</tr>
<tr>
<td>0</td>
<td>No response/task not attempted.</td>
</tr>
</tbody>
</table>
**Example 2: Social Studies; Probability & Statistics - Grades 9-12**

Amanda Wolfe is a high school American Government teacher. She is beginning a unit on the electoral process and knows from past years that her students sometimes have difficulty with the concepts of sampling and election polling. She decides to give her students a performance assessment so they can demonstrate their levels of understanding of these concepts. The main idea that she wants to focus on is that samples (surveys) can accurately predict the viewpoints of an entire population. Specifically, she wants to be able to assess her students on the following instructional objectives:

- Students will collect data using appropriate methods.
- Students will accurately analyze and summarize their data.
- Students will effectively communicate their results. (Step 1)

Since the purpose of her performance task is formative in nature, she decides to develop an analytic rubric focusing on the following attributes: sampling technique, data collection, statistical analyses, and communication of results (Steps 2 & 3). She drafts descriptions of the various levels of performance for the observable attributes (Steps 4 & 5). Here is her rubric.

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**Scoring Rubric**

**Population Sampling Performance Task**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Not Demonstrated 0</th>
<th>Beginning 1</th>
<th>Developing 2</th>
<th>Accomplished 3</th>
<th>Exemplary 4</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sampling Technique</strong></td>
<td>Sampling technique not included</td>
<td>Inappropriate sampling technique used</td>
<td>Appropriate technique used to select sample; major errors in execution</td>
<td>Appropriate technique used to select sample; minor errors in execution</td>
<td>Appropriate technique used to select sample; no errors in procedures</td>
</tr>
<tr>
<td><strong>Survey/Interview Questions</strong></td>
<td>Survey/interview questions not included</td>
<td>Inappropriate questions are asked; needed information is not gathered</td>
<td>Few pertinent questions are asked; data on sample is inadequate</td>
<td>Most pertinent questions are asked; data on sample is adequate</td>
<td>All pertinent questions are asked; data on sample is complete</td>
</tr>
<tr>
<td><strong>Statistical Analyses</strong></td>
<td>Analysis section not included</td>
<td>No attempt at summarizing collected data</td>
<td>Attempts analysis of data, but inappropriate procedures</td>
<td>Proper analytical procedures used, but analysis incomplete</td>
<td>All proper analytical procedures used to summarize data</td>
</tr>
<tr>
<td><strong>Communication of Results</strong></td>
<td>Explanation of results not included</td>
<td>Communication of results is incomplete, unorganized, and difficult to follow</td>
<td>Communicates some important information but is not organized well enough to support decision</td>
<td>Communicates most of the important information; shows support for decision</td>
<td>Communication of results is thorough and shows insight into how data predicted outcome</td>
</tr>
</tbody>
</table>

**Total Score =**

---

42
KEY POINTS

• Performance assessments allow teachers to assess students’ abilities to apply what they are learning, typically in a real-world context.
• Performance assessments involve a hands-on task or other application activity, as well as a scoring guide with pre-established scoring criteria.
• When using a performance assessment, determine in advance whether the results will be used for formative or summative decisions.
• Two types of scoring rubrics are:
  ✓ holistic rubrics
  ✓ analytic rubrics.
• Holistic rubrics are appropriate when some minor errors in the assignment can be tolerated, when there is no single correct answer, and when the goal is an overall assessment of student work.
• Use of holistic rubrics results in a single overall score (i.e., the assessment is unidimensional).
• Analytic rubrics are appropriate when there is a focused type of response required and when more specific feedback is desired.
• Use of analytic rubrics results in several separate scores, as well as a total score summed across all criteria (i.e., the assessment is multidimensional).
• Performance categories can be identified with either quantitative and/or qualitative labels.
• When trying to convert rubric scores to letter grades, do not think of rubric scores in terms of percentages of total points. There are typically more performance categories at the “average” and “above average” levels.
• One of the goals in using a scoring rubric is to try to differentiate between higher levels of performance.
• The bottom line is to find a system of converting rubric scores to grades that works you, fits comfortably into your individual system of reporting student performance, and is fair to the students.
References
Chapter 6

How Can You Teach Students Who Read at Different Levels?

Educators know how important reading is to continual learning and to college AND career readiness. Dedicated reading instruction occurs in the elementary grades, but reading instruction typically does not continue in grades 7–12. At the secondary level, reading should be the responsibility of all teachers in all disciplines. Teaching reading in the content area improves students’ reading proficiency, but it requires teachers to incorporate reading and vocabulary strategies into their instruction. Reading achievement data can help teachers determine when it is critical to use these strategies. In addition, teachers should use data in selecting reading assignments and to make adjustments in planned instruction.

Teachers need to know the reading levels of their students in order to select texts that are appropriately challenging. If the material is at a much lower reading level than the students, they may become bored and won’t be challenged to improve their skills. A more common problem is assigning texts that are far above the reading level of many students, who then fail to grasp the content and become disengaged and discouraged. Many teachers observe the symptoms of this mismatch between reading assignments and student proficiency levels but don’t know what to do about it. Obtaining and using reading data systematically could guide their decisions and actions.

**Lexile Reader Measures**

One of the best open-source measures of reading is MetaMetrics’ Lexile Framework™ for Reading (MetaMetrics), which evaluates the reading level of materials and students. The Lexile Framework for Reading places both the reader and text on the same developmental scale, which ranges from 200L to 2000L (Lexiles). Lexile measures provide valuable information about an individual’s reading ability and the difficulty level of a text. Lexiles can help teachers identify textbooks and other materials that are at the appropriate reading level for students.

**Lexile Text Measures**

A book, article, or piece of text – fiction or nonfiction – receives a Lexile text measure when it’s analyzed using the Lexile Framework for Reading, which is available online free of charge. MetaMetrics works with more than 200 publishing companies and has measured more than 150,000 books. Also, 100 million articles and websites have received Lexile measures. Similar to other reading metrics, Lexile measures the syntactic and semantic complexity of text. Lexile is unique, however, in providing a uniform scale that stretches from beginning readers to adulthood.

Many books, particularly textbooks, indicate the Lexile level on the copyright page. MetaMetrics® maintains an online database of analyzed texts at lexile.com, which teachers can search by title or author to locate the Lexile level of a book. The database can also be searched by subject and by Lexile level to locate texts at a desired reading level. For magazines and online publications, most library databases include Lexile levels of publications. For publications and other texts that are not in a database, there is a free online text analyzer in which to paste a representative portion of text. The Lexile analyzer will determine the level of the text.
Lexile Student Measure
A teacher can identify a student’s Lexile reader measure from a reading test or program. MetaMetrics partners with state departments of education and test publishers to create assessments or to link to existing assessments that can report students’ reading scores as Lexile measures. Your school or district may already have given students a reading test that reports results in Lexiles. If your school does not have student reading levels in Lexiles, frequently you only need to ask. If actual test scores are not available, another way to approximate student reading levels is to look up the titles of a few books that students read effectively and other titles they struggle with. Then look for texts that fall in between to find the approximate level of student reading.

Research by MetaMetrics has identified the range of typical reading levels of students by grade levels, as shown in Table 1. This also may help you in determining the reading level of students.

The authors of the Common Core State Standards (CCSS) include student desired learning targets in Lexile, as shown in Table 2. The center column shows the current reading level of students in grade level ranges. One goal of raising achievement with the new standards is to get the reading level of graduates to the 1300L range from the current 1100L to 1200L range, which will require raising the goals at each grade level. The right column indicates the desired goal for reading comprehension levels under the CCSS.

Another type of reading data that is useful for teachers to know is the level of reading proficiency that students will need in adult life. Sharing this information with students can help motivate them to improve their reading, perhaps to a specified goal. Lexile measures are available for adult reading, such as income tax forms and on-the-job reading.

### Table 1. Student Lexile Reading Levels

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reader Measures, Mid-Year 25th percentile to 75th percentile (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Up to 300L</td>
</tr>
<tr>
<td>2</td>
<td>140L to 500L</td>
</tr>
<tr>
<td>3</td>
<td>330L to 700L</td>
</tr>
<tr>
<td>4</td>
<td>445L to 810L</td>
</tr>
<tr>
<td>5</td>
<td>565L to 910L</td>
</tr>
<tr>
<td>6</td>
<td>665L to 1000L</td>
</tr>
<tr>
<td>7</td>
<td>735L to 1065L</td>
</tr>
<tr>
<td>8</td>
<td>800L to 1100L</td>
</tr>
<tr>
<td>9</td>
<td>855L to 1165L</td>
</tr>
<tr>
<td>10</td>
<td>905L to 1195L</td>
</tr>
<tr>
<td>11 and 12</td>
<td>940L to 1210L</td>
</tr>
</tbody>
</table>

### Table 2. Desired Reading Levels in Lexile

<table>
<thead>
<tr>
<th>Text Complexity Grade Band in the Standards</th>
<th>Old Lexile Ranges</th>
<th>Lexile Ranges Aligned to CCR expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2-3</td>
<td>450–725</td>
<td>450–790</td>
</tr>
<tr>
<td>4-5</td>
<td>645–845</td>
<td>770–980</td>
</tr>
<tr>
<td>6-8</td>
<td>860–1010</td>
<td>955–1155</td>
</tr>
<tr>
<td>9-10</td>
<td>960–1115</td>
<td>1080–1305</td>
</tr>
<tr>
<td>11-CCR</td>
<td>1070–1220</td>
<td>1215–1355</td>
</tr>
</tbody>
</table>
The Successful Practices Network has analyzed hundreds of employee reading materials in various career clusters (Daggett). The Lexile levels for entry-level reading requirements in various careers areas are listed below. Reading is an important skill not only for succeeding in school, but also for succeeding in work and life. Teachers can make their instruction more relevant by impressing upon students the importance of reading in school as it relates to career readiness. The data in this table can help students to understand the reading expectations they will encounter beyond school. For example, a student who expresses a desire to work in law enforcement needs to read in the range of 1420L – 1740L in order to understand reading materials connected with that occupation. This gives students a quantifiable reading goal related to career aspirations.

<table>
<thead>
<tr>
<th>Career Clusters in alphabetical order</th>
<th>Lexile Text Measure (3rd Quartile Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture/Natural Resources</td>
<td>1270 – 1510L</td>
</tr>
<tr>
<td>Architecture/Construction</td>
<td>1210 – 1540L</td>
</tr>
<tr>
<td>Arts/AV Technology/Communications</td>
<td>1100 – 1190L</td>
</tr>
<tr>
<td>Business and Administration</td>
<td>1210 – 1310L</td>
</tr>
<tr>
<td>Education and Training</td>
<td>1320 – 1370L</td>
</tr>
<tr>
<td>Health Science</td>
<td>1260 – 1300L</td>
</tr>
<tr>
<td>Hospitality and Tourism</td>
<td>1230 – 1260L</td>
</tr>
<tr>
<td>Human Services</td>
<td>1050 – 1200L</td>
</tr>
<tr>
<td>Law and Public Safety</td>
<td>1420 – 1740L</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1200 – 1310L</td>
</tr>
<tr>
<td>Retail/Wholesale Sales and Service</td>
<td>1180 – 1270L</td>
</tr>
<tr>
<td>Scientific Research/Engineering</td>
<td>1190 – 1250L</td>
</tr>
<tr>
<td>Transportation, Distribution and Logistics</td>
<td>1170 – 1350L</td>
</tr>
</tbody>
</table>

* for the 13 Career Clusters for which there were adequate text samples

**Reading Strategies**

Matching reading assignments to reading levels of students does not mean lowering expectations. Occasionally, when assigning informational reading, you may be able to substitute an alternative reading assignment. But often there will be a text that all students must master. In these instances, if you identify significant gaps between the Lexile level of the text and the average reading level of your students, there are dozens of pre-reading and post-reading strategies that are helpful in increasing students’ comprehension of difficult text. One excellent resource for teachers in subjects such as science, social studies, mathematics, arts, and CTE is *Effective Instructional Strategies for Content Area Reading 7-12* (International Center for Leadership in Education).

The following chart summarizes the steps for using data to plan reading instruction for your students.
KEY POINTS

- Identify the current reading proficiency levels in Lexiles of your students, both averages and ranges.
- Ascertain the Lexile reading level of materials you use in instruction.
- Determine the Lexile target reading levels for your grade level to be on track for college and career readiness or entry-level positions in various career clusters.
- Discuss with students their current reading proficiency and goals.
- Adjust reading materials to address significant difference in student reading levels.
- Use pre-reading and post-reading strategies to increase comprehension when student tackle difficult reading passages.
**A Scenario**

Ron Cortes, a construction trades teacher, gets great satisfaction in seeing his students develop practical, hands-on skills. Some of them may pursue careers in construction; others will become successful do-it-yourselfers who are able to work safely with tools. His major teaching frustration is reading. There is wide diversity in reading ability in his class. He is sure some students can read college-level materials, yet other students have great difficulty with reading and are probably equivalent to elementary school readers. In addition to the hands-on activities using tools and equipment, there is still a great deal of material that students need to read, such as are safety manuals and description of new construction materials, techniques, and research. Ron tries to keep his instruction engaging by focusing on projects. He avoids using a standard textbook, but there are manuals and websites that students must read and understand. Recently, he actually avoided giving a reading assignment because several students had found similar material so frustrating.

One day, in talking with other teachers before a staff meeting, he was voicing his concern about reading issues and how difficult it was to teach a class with such variation in reading levels. A colleague suggested that he talk to Sheila Jackson, the reading coach. He made appointment to talk with her, and she did have a number of suggestions.

Sheila explained that text with a large number of new words makes comprehension difficult. Readers try to figure out unfamiliar words from the context. If a text passage has a large number of unfamiliar words, there is little context to aid in understanding them. She suggested strategies for Ron. First, analyze the level of reading materials that he was selecting in his class (this included both manuals and Internet websites). She was able to direct him to a website that he could locate the Lexile reading levels for a variety of materials. There was even a Lexile Analyzer in which he could place portions of text passages from the online construction articles to have these analyzed.

In addition, she introduced Ron to some reading comprehension activities which could be used as pre-reading or post-reading activities. She pointed out that it is not sufficient simply to assign reading, particularly when the assignments might be difficult for students. She gave him information on activities to do prior to a reading assignment to help to build students’ knowledge about the topic and help them benefit from the reading.

Ron also discovered from Sheila that the school had data on his students regarding their reading comprehension levels. She introduced him to Lexile Framework for Reading and explained how important it is to be able to quantify your students’ reading comprehension levels and be able to select reading materials that are a natural or reasonable stretch for students to understand. So, rather than thinking about his students as college-level readers or grade level readers, he was actually able to identify the Lexile reading level of each student. He used the Lexile analyzer to find out the levels of the reading material he was planning to assign. Several were extremely high, so he been looking for alternatives that would not be as challenging. This is not always possible, because some are instructions or manuals or other real-world materials that students have to read. In those cases, Ron plans to use one of the pre-reading strategies he learned about from Sheila to help students understand the content before assigning the reading.

He has two students who read at a very low level. Using the Lexile database, he has been locating magazine articles that are at a lower level on the construction topics he is introducing. This gives them some understanding of the topic before having to stretch their reading ability.
It has helped Ron to have a data-driven tool that allows him to think more critically about his choices of reading materials and matching them to his students. When there are significant gaps, he introduces interventions through reading strategies, which has greatly reduced the anxiety in the classroom and increased student engagement and achievement. He no longer sees reading as a problem that prevents students from learning construction skills, but rather as useful way to improve their construction skills.

References
We are all familiar with data which shows that, on average, more years of education leads to greater lifetime earnings. College graduates are more likely to have a job and, on average, earn significantly more than non-college graduate (Carnevale). Typically, students who have a bachelor’s degree will earn two-thirds more over their working careers than students who have only a high school diploma (Baum, et al.). This is the statistic that encourages parents and educators to stress to students that earning a college degree is essential. However, we need to recognize that these are averages, that there is great variation in college graduates’ actual earnings, and that many students with college degrees discover that they are unable when they’re unable to find high paying jobs in a career field of interest.

Jobs and careers can be rewarding in many ways. For example, many low- or average-paying jobs can be highly rewarding to individuals because they are fulfilling, because they serve the needy, or because they provide satisfaction in ways other than monetary. However, in terms of earning power, it does make a difference to have a college degree. But – and this is a big but – it matters more what your major is in college. Not all college majors lead to successful careers. The message to students about continuing their education needs to be focused on more in-demand, i.e., “saleable,” credentials than on simply earning a degree. It means accumulating the skills and knowledge in a career pathway that provides opportunities to grow and advance to higher-paying positions. This is not only about selecting a major in college, but also about beginning to develop experiences in elementary and secondary school that have clear pathways of connected learning which can lead to viable employment and lifelong, self-sufficiency and financial independence in a rewarding career.

Teachers and counselors in secondary schools need to ensure they are providing accurate information that reflects labor market trends to help students make choices about career paths they wish to pursue. An excellent resource on labor market data is A Guide for Using Labor Market Data to Improve Student Success (Aspen Institute). In addition to suggestions on using the data, the guide has links to each state’s department of labor for locating state data.

The U. S. Department of Labor Bureau of Labor Statistics <http://www.bls.gov> has a wealth of resources for teachers seeking to share labor market information with students and give students support for career planning. These federal statistics include projections of the most rapidly growing occupations for the decade ahead. The data includes the level of education necessary for each of them. Many of the largest and most rapidly growing areas of employment are in “clusters” of careers that require a two-year technical degree.

A data set released by the U.S. Department of Education in June 2012 showed “gainful employment” reports containing job placement rates for 3,695 vocational program graduates from 1,336 institutions, including community colleges, public and private four-year colleges, and for-profit colleges. Such research gives students and parents useful information on which postsecondary programs are likely to
lead to employment. Although a recent court decision makes it unclear whether these reports will be replicated in the future, the 2012 data sets provide a snapshot that can be used to assess the effectiveness of programs compared to the same programs at other institutions.

Studies show that college students who choose a program of study have higher completion rates than those who are undecided (Jenkins) and have no “declared major.” This seems like common sense: students without a career or employment goal have less clarity about why they should complete a degree and are therefore less likely to persevere to earn a degree.

A great resource for examining the connections between school and careers is the Common Career Technical Core (NASDCTEc). It provides a common benchmark for what students should know and be able to do after completing career-related instruction. Business/industry representatives, educators, and others helped guide the development of the Common Career Technical Core (CCTC) to ensure that CTE students will have the knowledge and skills to thrive in a global economy.

The CCTC is a set of rigorous, high-quality standards for CTE that can be adopted voluntarily. It includes standards for each of the 16 Career Clusters and their corresponding career pathways. The CCTC also includes an overarching set of 12 Career Ready Practices that apply to all programs of study. These practices address the knowledge, skills, and dispositions that are important to becoming career ready.

The following list illustrates the steps in using labor market data in education planning.

### KEY POINTS

- Up-to-date state and regional labor market data trends and projections are shared with staff and students.
- Students are knowledgeable about pathways in education programs that lead to promising postsecondary programs linked to growing career fields.
- Students are aware of how secondary courses and programs form pathways to postsecondary programs and careers.
- Students are familiar with the career credentials and certificates that may be earned through secondary and postsecondary career pathways.

### A Scenario

Kim Newlin is in her third year of teaching engineering technology courses at Winchester High School. She enjoys the opportunity to engage her students in hands-on projects that include communication and robotic systems. These are areas of technology she was passionate about, and she shares that passion with her students.

Overall high school enrollment was declining slowly, but what worried her more toward the end of the year was the declining enrollment in her individual courses. In spite of the high interest level of many students, it was difficult for them to enroll in her courses because of conflicts with Advanced Placement courses or the need to repeat math courses to meet diploma requirements.
She arranged a meeting with the principal to discuss her concerns about declining enrollments and to try to plan a course of action that would provide opportunities for more students to take advantage of engineering technology courses. The elective course offerings at Winchester High School had been in place for some time and were usually driven by interest of the teacher, although there was high interest from students in taking the individual courses.

Kim was challenged by her principal to begin to think differently about her elective courses. The principal acknowledged that her main responsibility was not to keep elective courses at full enrollment but to provide experiences that ensured that students were ready for college and career. She stated that the primary interest of most parents was making sure their children met the entrance requirements for college. Students might be interested in technology career goals, but the stated family priority to continue their education in college.

Of course, Kim knew about the focus on preparing students for college, but she also knew from talking to high school graduates that many went on college but failed to find success and often dropped out after a semester or two. She began to think about how she could build student experiences in engineering technology and better prepare them to succeed in postsecondary education. She arranged a meeting with the engineering department chairperson at the local two-year college, whom she knew from professional meetings. He relayed that the college was trying to recruit more students for majors in engineering and technology fields because of two significant economic developments occurring in the region. The federal government was establishing a new research facility for commercialization of drone aircraft. The facility would require technicians in avionics, electronics, and communications. The second initiative was a state-funded project to create a nanotechnology incubation research facility in green technologies. This was likely to create hundreds of jobs in many different areas of electrical engineering, and biological and information technologies. He was gearing up his programs to offer courses related to these job opportunities.

Kim could see a great opportunity to begin to connect the experiences in high school with the college programs in technology and engineering in these emerging fields. She set up a meeting with technology teachers from area high schools and the department chair from the college to begin discussing how they could revamp the high school curriculum into career pathways that would introduce students to these postsecondary options. She collected data on potential job openings and the education demands of these jobs, as well as typical starting salaries. Enthusiasm around the project expanded, and soon they were able to include representatives from several businesses in related fields, based on the recommendations from the college.

As a result of Kim’s leadership with her peers, several of the high schools, including Winchester, have revised their engineering technology courses to align with the emerging programs being developed at the college. The college agreed to an articulation agreement that would give students advanced standing in these programs if they completed the high school programs. Armed with data and an articulation agreement, Kim was now able to explain to students that the technology courses were not simply electives to fill up part of their school schedule, but were steppingstones to a college program that led directly into viable, well-paying career options.

The lesson here for high school staff is that courses should not be based on past experience and personal preferences of teachers. Students need to learn career and technical skills while still in high school in order to explore their personal talents and interests and begin to make practical career plans. Success does not come from going on to postsecondary education alone, but from selecting majors that
lead to rewarding, engaging, well-paid, and plentiful employment opportunities. Creating a pathway of high school experiences directly connected to postsecondary programs provides options to recruit students at the secondary level and is more likely to lead to success in earning a degree and finding a job.

References
How Do You Know If Instructional Changes Are Making a Difference in Student Learning?

For decades, teachers have "experimented" with changes to their instruction for the purposes of improving student learning. Often, these experiments consisted of relatively simple trial-and-error attempts at improving instructional practices. In today's schools, however, haphazard attempts at trial-and-error instructional improvement must be enhanced through the use of a more systematic and scientific approach to improvement and data-driven decision-making.

Our current educational climate encourages educators not only to share innovative classroom practices, but also to collect and share evidence of the impact that those innovative practices are having on student learning. Using an action research approach in your classroom may be the key, not only as a mechanism for determining whether or not your instructional changes have made a difference and have been effective, but also to serve as evidence of what your students may or may not be learning.

What is Action Research?

“Doing research” is a term that can make educators uncomfortable. They sometimes equate it with endeavors that they believe to be “scientific” in nature, or they may have “flashbacks” to graduate courses in research methodology and/or statistical analysis. Although there may be some degree of accuracy in these interpretations and connotations, quality research should be viewed as an ally in the teaching and learning process. Research can provide a systematic mechanism for collecting meaningful student data - and then using the data as the basis for well-informed decision making. After all, data-driven educational decision-making has become one of the primary focal points for the work that we do as professional educators. It really does not matter if you are an early childhood educator, a middle school administrator, or a college professor—educational decision-making should have its basis in hard data, gathered primarily from those whom we are charged to educate.

Research has its foundation in the application of the scientific method, regardless of the field in which the research is being conducted, and the broad field of education is no exception. We are all undoubtedly familiar with the scientific method; many of us had our introduction to the process during middle school or the first time we did a science fair project. We probably began by identifying a topic and stating a research question we wanted to answer or a prediction (i.e., a hypothesis) we wanted to test. We then designed an “experiment” and collected our own empirical data. Once we had analyzed our data, we used the results as evidence necessary to answer our research question or pass judgment on the prediction we made at the outset of our study.

Unfortunately, many educators find traditional educational research to be esoteric and typically not applicable to their particular context and setting. While there are numerous similarities between traditional educational research and action research, there is one crucial difference. Action research is conducted by educators for themselves (Mertler, 2014). Traditional educational research is often conducted by university professors or graduate research assistants, individuals who are—at least to some degree—removed from the situation and classroom setting that they are investigating. In contrast, action research is conducted by the individual or individuals who play an active role and have a vested
interest in the particular outcome. Johnson (2008) has described action research as being true systematic inquiry into one’s own practice. More specifically, Mills (2014) defines action research as any systematic inquiry conducted by teachers, administrators, counselors, or others with a vested interest in the teaching and learning process or environment for the purposes of gathering information about how their particular schools operate, how they teach, and how their students learn. In other words, action research is a systematic and scientific process for studying your own practice, in your school and classroom, and with your students. The distinct benefit of action research is that you are studying your own instructional practices, and—through the collection of student data—you can determine the extent to which your students are actually learning.

Action research can be a vitally important undertaking for educators at all levels. There are numerous beneficial applications of action research in schools (Mertler, 2013; 2014). Action research can be used to:

- **Connect theory to practice** — Action research focuses on systematic inquiry to provide solutions to local-level problems.
- **Improve educational practice** — Since educators engage in reflective and critical examination of their own practices, the results can lead to improvements in classroom practices.
- **Implement widespread school improvement** — When an entire school engaged in action research, the benefits of positive results can have schoolwide impact.
- **Empower teachers and foster intellectual engagement** — When teachers systematically examine their own practices—including the collection and analysis of data from their own students—they become empowered to make data-driven decisions and to lead education improvement efforts.
- **Identify educational problems** — The early steps of the action research process can be used to identify instructional and learning problems in the classroom.
- **Develop and test potential solutions** — After problems have been identified, the overall action research process can be used to devise special solutions to those problems.
- **Foster inservice professional growth and development** — One of the most important benefits to engaging in classroom- and school-based action research is that it can be used to customize professional development that is both meaningful and lasting.

As mentioned in the introduction to this section, for decades educators have utilized a trial-and-error process in attempts to improve their instruction to enhance their students’ learning. Using this process, teachers would initially come up with ideas that they wanted to try in their classrooms. Once they had “sketched out” an idea—and had developed lesson plans and any materials and activities—they would try out the idea with their students. After doing so, they would somehow—usually very informally and often based on anecdotal evidence—determine if the new approach was effective. Finally, they would reflect on the process in order to determine what they would do next with respect to the new instructional or classroom management idea. Essentially, this scenario represents a simplified version of action research. However, “real” action research is a more formalized process of studying instructional practice and student learning.

For example, suppose an 8th grade English Language Arts teacher observed that the students in the six sections of her course were not performing well on the reading comprehension portion of the annual standardized test. She investigated possible solutions to that dilemma—by looking at published research literature and by talking with her colleagues—and determined that teaching her students to annotate while reading, using various annotation techniques, might be an effective strategy. She administered a pretest—in the form of a practice standardized reading assessment—to her students and recorded the
score for each student. She then randomly divided the six sections of her course into three sections that would receive instruction on annotation techniques (i.e., the “experimental” group) and three that would not receive such instruction (i.e., the “comparison” group). Following her instruction, she administered a posttest to all six sections and compared the average amount of difference between the two sets of scores—posttest minus pretest scores—for the two groups. She observed that the experimental group achieved an average increase of 9.0 points on the reading comprehension posttest, while the comparison group experienced an increase of only 1.5 points. She concluded that this was ample evidence of the effectiveness of including instruction on various annotation techniques for all of her future classes.

The Process of Conducting Action Research
Action research can be viewed as a four-stage cyclical process consisting of the following stages:
1) The planning stage — planning for your action research
2) The acting stage — implementing the plan
3) The developing stage — developing an action plan for implementing the findings and future cycles of action research
4) The reflecting stage — reflecting on the process

This four-stage cyclical process is depicted in Figure 2 (Mertler, 2014).

Figure 2. The Cyclical Process of Action Research
There are nine specific research activities that fall within these four stages. These nine steps—as they are embedded within the four stages, as follows:

**The Planning Stage:**
1) Identifying and limiting a topic
2) Gathering related information
3) Reviewing related literature
4) Developing a research plan

**The Acting Stage:**
5) Collecting data
6) Analyzing data

**The Developing Stage:**
7) Developing an action plan for implementing the findings and for future cycles of action research

**The Reflecting Stage:**
8) Sharing and communicating the results
9) Reflecting on the process

An expanded visual depiction of the action research process appears in Figure 3. For a much more detailed presentation, please refer to *Action Research: Improving Schools and Empowering Educators*, 4th edition (Mertler, 2014).
Figure 3. Four Stages and Nine Research Activities of Cyclical Process of Action Research

Although the diagram in Figure 3 may appear somewhat linear, this is merely to show the relationships between adjacent stages or steps. The process of action research is actually cyclical in nature: it has a clear beginning, but it does not have a clearly defined endpoint. Typically, teachers design and implement an action research project, collect and analyze data to evaluate its effectiveness, and make revisions and improvements for future implementation. In all likelihood, the teacher would implement the project with the next group of students, when the effectiveness would again be monitored and subsequent revisions made. A given project may never have a clear end; there may be cycles of implementation, evaluation, and revision from one semester or year to the next.

In addition, the cyclical nature of action research is facilitated by the connection of the reflecting stage to the planning stage of the subsequent cycle, as shown by the dashed arrows in Figure 3. This reflects the fact that the outcome, results, and/or reflections from one cycle provide the impetus for the next cycle of action research. This is a critical feature of action research: it never really ends, the same way that an educator’s professional growth never ends. The action research may continue along the same line (i.e., topic or problem of interest) in subsequent cycles, or it may branch off in a different direction. Again, this is like an educator’s professional growth: sometimes, we feel the need to further our profession development in a particular area; other times, we feel the need to branch off and grow in a different direction.
Educators often ask what kinds of data can be used when conducting action research. The answer to that is any and all forms of student and school data. More specifically, however, Figure 4 lists some possible sources of action research data that might be used.

![Figure 4. Possible Sources of Data for Action Research Studies](image)

- Observations
- Interviews
- Student journals
- Teacher journals
- Class journals
- Existing documents/records
- Classroom artifacts
- Surveys & questionnaires
- Rating scales
- Checklists
- Formative assessments
- Summative assessments
- Standardized test scores
- Demographic data

It is important to note that the nine steps of the action research process are meant to serve as guidelines when conducting a study (Johnson). They should be adapted to the particular problem or topic, as needed. Furthermore, it may be appropriate to skip some steps, rearrange their order, or repeat them in some instances. The key to worthwhile practitioner-conducted action research rests in the questions or problems that are addressed and the extent to which the ultimate results are meaningful and important to that educator (Parsons & Brown), not necessarily in the steps by which those results were obtained.

**A Scenario**

For some time, Sydney Harrison, a health sciences educator, has been disappointed in the performance of her students when it comes to blood-type testing, specifically the ABO test (to determine blood group antigens) and the Rh test (to determine the Rh antigen). Her students seem to be very careless when conducting these tests, and the results are often incorrect. It does not seem to matter whether the students use real blood samples (i.e., their own) or artificial blood samples. On a practical examination in which students test a blood sample and reported the blood type and the Rh factor, they typically achieve about a 55% accuracy rate. This had been consistent over the last several years, even though she has stressed the importance of accuracy. Sydney has decided to bring in several guest speakers who perform blood testing and typing for a living, in order to impress upon the students the seriousness and potential ramifications of incorrect blood typing testing.

**Step 1: Identifying and Limiting the Topic**

The blood-type testing lessons are typically taught in March. Sydney began to contact guest speakers in January to schedule them to come during a two-week period in March. She hoped that by bringing in health professionals to speak about the importance of accurate testing and interpretation, her students’
accuracy would improve. She decided to focus specifically on the skills related to accurate testing and interpretation of the results.

**Step 2: Gathering Information**
To gather some background information on teaching this particular set of skills, Sydney first explained the problem to her guest speakers and asked for their opinions about ways that she might teach this skill differently in order to impress upon her students the importance of accurate testing. In addition, she searched the Internet for additional resources to enhance her instruction during this unit. She also requested suggestions through an online forum of colleagues from the professional organization to which she belongs.

**Step 3: Reviewing the Related Literature**
Sydney made the decision to collect more formal information. She conducted an exhaustive search of health sciences and health education journals to locate any research studies that may have investigated alternative methods, techniques, and materials for teaching, reinforcing, and assessing students’ abilities to conduct accurate blood type testing.

**Step 4: Developing a Research Plan**
From her review of the literature and discussions with professionals, Sydney found enough evidence to support the focus of her proposed study of the effectiveness of guest speakers to reinforce particular skills. She also found some contradictory evidence (i.e., that using guest speakers is less or at least no more effective than the reinforcement she has used in past school years). She therefore specified the following researchable question: *Is there a difference in students’ blood testing accuracy between those who receive additional instruction from professional speakers and those who do not?* Furthermore, based on the review of the literature and other information, she stated the following hypothesis: *Students who are exposed to guest professional speakers will demonstrate a higher rate of accuracy, as evidenced by the results of their blood antigen and Rh tests, than those not exposed to additional professional speakers.*

Since her hypothesis implied a comparison study, Sydney decided to split the six sections of health education for the coming semester. Three random sections would get to experience the integration of the guest speakers and the other three sections would not. Student data resulting from their performance on both a written examination and a practical examination—which both of which are teacher-developed assessments—would be collected from all students.

**Step 5: Implementing the Plan and Collecting Data**
Sydney introduced the unit near the end of February. She instructed the students on blood types, antigens, and Rh factors. Prior to beginning the hands-on laboratory section of the unit, three health professionals visited the three selected sections to discuss the nature of their work, the importance of accuracy and being careful, and the potential ramifications of errors.

All students engaged in several days of blood antigen and Rh testing. Upon completion of the hands-on portion of the unit, she administered the written examination, followed by the practical blood testing examination. She scored both examinations for each student and entered all scores into a spreadsheet.
Step 6: Analyzing the Data
Test scores resulting from the administration of both exams were statistically compared for the two groups. The written test scores of the students who interacted with the professional health care workers were significantly higher—by an average of 5.5 points—than those of the students who did not have the benefit of that interaction. In addition, there was a significant difference in favor of the same group, by an average of 9 points, on the practical examination. In other words, the original research hypothesis had been supported by the student exam data.

Step 7: Developing an Action Plan
With her findings in hand, Sydney approached her principal and the district curriculum coordinator about the impact of integrating of speakers into the health sciences program. Using the student data as evidence, she made the case for a small fund to be created that would help support the regular invitation of speakers into their courses. The principal and coordinator agreed to develop this type of program in subsequent years and to collect and analyze student data. Similar findings would provide a much stronger case for permanently enhancing the approach to teaching various concepts and skills in the health sciences.

Step 8: Sharing and Communicating the Results
The principal and curriculum coordinator were impressed with the results of Sydney’s’ action research study. They suggested that she make a presentation to the school board and to the entire school faculty at a regularly scheduled meeting at the beginning of the next school year. She made an effective presentation at the next month’s board meeting. Another health sciences teacher who attended the board meeting later suggested that this study might make an interesting contribution to an annual statewide conference on best practices in career and technology education held each fall.

Step 9: Reflecting on the Process
Once the school year ended, Sydney took time to reflect on her experience during the preceding semester. She made notes regarding adjustments to the process of incorporating speakers and other potential topic areas for speakers for next year. She considered several questions, including:

- How well did the process of incorporating speakers work?
- Am I sure that the data I collected was the most appropriate in order to answer my research question?
- Were there additional types of data that could or should have been included in the data collection?
- Were there any unintended consequences of incorporating speakers into my instruction?

Her answers to these questions will help guide next year’s implementation of the health sciences speaker professional speaker program.
KEY POINTS

• Educational research has its basic foundation in the application of the scientific method.
• Traditional research in education is typically conducted by individuals somewhat removed from the setting they are studying; action research is conducted by individuals with a vested interest in the topic, problem, or setting.
• Action research is a form of educational research; the only real difference is its underlying purpose.
• The main goal of action research is to address local issues in anticipation of finding immediate answers to questions or solutions to problems.
• The process of conducting action research consists of 4 stages:
  ✓ planning
  ✓ acting
  ✓ developing
  ✓ reflecting
• Embedded within the 4 stages of action research are 9 specific steps or activities.
• Action research is a cyclical process that has a clear beginning but may not have a specific endpoint.

References

Chapter 9

What Are Your Students’ Perceptions about School?

Some types of information that can help schools make data-based decisions are readily available and easily quantified. Other information is not as accessible or is based on casual, anecdotal, or subjective input. This is particularly true about collecting data on how the students perceive the effectiveness of instruction, their relationships with adults and other students in the school, and the overall learning environment. Perceptions often matter as much as reality, so measuring how students perceive school is a valuable source of data in determining how to make the school more effective and students more successful.

Several years ago, Victoria Bernhardt, executive director of Education for the Future, a professor, and the author of numerous books about data analysis, identified four major categories of data. Bernhardt’s system is now one of the standard categorizations used in education (Bernhardt). The four data types are:

- demographics
- student learning
- school practices
- perceptions

Effective use of data involves a balance among the four types, and schools will make more progress in improving instruction by achieving this balance. Schools study demographics, student learning, and even school practices, but often neglect perceptions. Students’ perceptions can provide powerful data and serve as a conversation starter for staff to focus on actual needs and effective interventions.

Perceptions can be gained from the results of surveys that quantify the opinions of staff, students, and parents regarding program effectiveness and student achievement. Such surveys might quantify values and beliefs or enable observations about the quality of the school and student learning, especially in areas that cannot be easily measured on objective tests. Once data is collected, it can be useful for school improvement. If administered properly, surveys can translate perceptions into quantitative data that can be charted, compared, and analyzed.

Listening to Learners
Not every aspect of evaluating the quality of a school can be measured by student assessments. There are nuances of success in learning that do not show up in standardized tests. Data around these perceptions is equally important in making judgments about what is working and what needs to be changed. Educators can quantify these perceptions with well-constructed surveys that examine what students think is --- or is not --- working in their school. There are several commercial surveys on the market or schools can also create their own. The advantage of using an existing product is that the statements have been vetted and edited for clarity and so are less likely to yield invalid results.
Moreover, a national survey gives a school some outside benchmarks with which to compare its own results.

Annual measures of student achievement generally occur too late for teachers to do much with or about the results during the current year. Student surveys, however, can be given early enough in the year to help teachers identify where they need to focus so that their current students may benefit. Surveys can be indispensable complements to other data-collection efforts. For example, a survey might reveal students are confused by or uncomfortable with a change of teaching strategy or procedure.

A national research study by the Bill & Melinda Gates Foundation helps to give credence to the importance of student perception surveys. The MET (Measuring Effective Teaching) project was a three-year study to identify the best practices to support teacher evaluation. The three primary measures examined were classroom observation, student achievement gains, and student perception surveys. The report, Asking Students about Teaching: Student Perception Surveys and Their Implementation (Bill & Melinda Gates Foundation), focused primarily on effective practices, but perception data can be used for many school decisions beyond evaluating individual teachers. It all depends on how you collect and use the data.

Following are recommendations for perception surveys from the study:

1. Measure what matters. Good surveys focus on what teachers do and on the learning environment they create. Surveys should reflect the theory of instruction that defines expectations for teachers in a system. Better survey results should also have better outcomes on measures of student learning.

2. Ensure accuracy. Student responses should be honest and based on clear understanding of the survey items. Student confidentiality is a must. Accuracy also means that the right responses are attributed to the right teacher/school.

3. Ensure reliability. Teachers should have confidence that surveys can produce reasonably consistent results and that those results reflect what they generally do in their classrooms—not the idiosyncrasies of a particular group of students. Reliability requires adequate sampling and an adequate number of items—but without overtaxing students.

4. Support improvement. Measurement for measurement’s sake is wasted effort. Teachers should receive their results in a timely manner, understand what they mean, and have access to professional development resources that will help them target improvement in areas of need. Student surveys are as much about evaluating systems of support for teachers as they are about diagnosing the needs within particular classrooms.”

Creating a Student Perception Survey
You may wish to create your own perception survey, especially if you are focusing on a specific instructional practice or group of students. Some suggestions for making a good survey include:

• Be clear on your objectives for the survey (i.e., what do you want to know?).
• Choose the types of items that will help answer your own questions and goals. Ask for a range of responses rather than simple Agree/Disagree or Yes/No.
• Make sure your questions are clear and unambiguous. A good way to check for this is by pilot-testing the survey. Be as specific as possible as to observations the students will respond to. Avoid using broad generalities, such as “good,” “like,” or “happy.”
• Ask only questions that are relevant to them.
• Keep the survey as short as possible while meeting your objectives; be respectful of respondents’ time and effort.
• Choose an appropriate distribution method for your survey, and be sure individual responses are anonymous.
• Use multiple questions that relate to the same perception to determine if responses are consistent.
• Insert occasional negative or reverse questions to reveal if students might be simply filling in random responses or the response they think you want to hear.

Perception Surveys Schoolwide
The main purpose of using student perception data is not to look at individual teachers but to assess overall school conditions for learning. One excellent example is the WE Learn survey in the WE™ Survey Suite, produced by the not-for-profit Successful Practices Network <www.spnetwork.org>. The schoolwide data collected by the WE Learn survey does not “lay blame,” but rather draws attention to needs that school must address.

Creation of the WE Survey Suite grew out the 2005 multi-year study conducted by the Successful Practices Network with support from the Gates Foundation. The Successful Practices Network collaborated with the Quaglia Institute for Student Aspirations to develop a set of surveys to capture staff and student perceptions of their school culture. The result was the WE surveys:
• WE Teach Instructional Staff Survey
• WE Learn Student Survey (Grades 3-5 and Grades 6-12)
• We Lead Whole Staff Survey
• We Support Community Survey
• We Are Ready (new student and staff survey)

Seven years of national data collected anonymously from hundreds of thousands of surveys provides insights into how school cultures are perceived by students and teachers. Such data has been – and can be – used to improve student engagement and achievement.

Rigor, relevance, relationships, and leadership were identified by the Successful Practices Network as four key elements present in successful schools across the country which promote innovation and change. Every school should aim to create a culture that focuses on these elements to meet the needs of all students. Using these attributes as an organizing framework provides a shared vision for recognizing and developing effective practices to support student goals. The WE Learn survey focuses the three “R’s” and school leadership.

A WE Learn survey report is provided following every administration of the survey. It gives educators a unique chance to look at their school through the eyes of its students. The report offers a context for exploring if students feel they are being challenged, whether they think what they are learning is connected to the world around them, the relationships they have in school, and how much they know about the goals of the school. By exploring and discussing these results, schools will gain valuable insights into the learning environment, effectiveness, and overall “health” of the school as a learning community. Those insights can then be used to identify issues, assess needs, and devise action plans aimed at rigor, relevance, and relationships for all students.
Comparing Teacher Perceptions to Student Perceptions
The WE Teach Instructional Staff Survey assesses staff perceptions of the three “R’s.” The results can help guide decisions about improving student achievement and promoting the highest teaching and learning standards. Analyzing the parallel items in the WE Learn and WE Teach surveys can be especially revealing in showing disconnects between the perceptions of students and their teachers. This data can be a starting point for teachers and leaders to discuss the results and explore the reasons behind them.

Perception Surveys in the Classroom
The Met project highlighted several commercial perception surveys appropriate for individual classroom use. These included:

**Tripod (www.tripodproject.org)**
Developed by Harvard researcher Ronald Ferguson; distributed and administered by Cambridge Education. It grew out of study of student engagement and related teaching practices.

**YouthTruth (www.youthtruthsurvey.org)**
Developed and distributed by the Center for Effective Philanthropy. It started as school-focused tool at secondary level and now includes classroom-level items adapted from YouthTruth Rigor & Relationships constructs and Tripod 7 Cs.

**My Student Survey (www.mystudentsurvey.com)**
Developed by Ryan Balch, Expert Fellow at Vanderbilt University. It is based on research-based teaching practices and validated observation rubrics such as Framework for Teaching.

**iKnow My Class (www.iKnowsurvey.com)**
Developed by Russell Quaglia at the Quaglia Institute for Student Aspirations as tool for teacher feedback. This formative course assessment is designed to help teachers promote the conditions that inspire students to reach their fullest potential. The survey is also available from the Successful Practices Network <www.spnetwork.org>.

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### KEY POINTS

- Determine your purpose for administering a survey (e.g., school improvement? teacher evaluation? teacher reflection?)
- Decide whether to collect student perceptions as an entire school or on individual teachers.
- Determine whether there is a commercial survey that meets your purpose or if you need to create your own.
- Administer the survey and collect data.
- Keep data analysis consistent with your purpose in collecting the data. Do not change your purpose after data is collected or share it with a different audience.
A Scenario

Linda Fishman is a 9th grade English teacher. At the beginning of the semester, her principal invited her to be a member of a school planning team that was going to engage in a process to reflect on instruction and look for ways to improve the rigor and relevance of student learning. Linda was a little skeptical of this activity; however, she accepted the invitation because she felt complimented that the principal believed she could be a contributing member of this teacher leadership group. Prior to the first meeting, the school conducted two surveys. The WE Learn Student Survey asked students a number of questions about their instruction. The teachers understood that this survey was collecting schoolwide data and was not an extension of teacher evaluation or rating individual classrooms. The other survey, the WE Teach Instructional Staff Survey, examined teaching practices and student behaviors.

At the beginning of a two-day meeting of the planning team, the survey results were presented and the group began to examine the students’ perceptions of school. Linda was a little suspicious about using student perceptions as a basis for strategic planning, but she became more committed as they discussed the findings. Linda and her colleagues were encouraged by the comparisons of their results to the national sample, which showed that students in her school were much more positive about learning. She was also pleased that, when disaggregated by grade level, the data showed that 9th grade students were more positive about school than 11th and 12th graders. Linda and her colleagues credited this to the school’s intense focus on engaging these students through creation of the Ninth Grade Academy.

However, what generated the most discussion were some significant discrepancies between teacher responses and student responses. When they looked at the item regarding whether students could “apply what they’re learning to their everyday lives,” a much higher percentage of the teachers agreed with the statement compared to the students. In the items related to relationships, there were even greater differences between teacher perceptions and student perceptions. Far fewer students believed their teachers knew about their academic goals and their interests outside of school than did teachers. These discrepancies created intense conversations. It was clear that the students didn’t really understand how much the teachers cared about them. But, true or not, the students’ perceptions were the “reality” that staff needed to address. Despite some differences in wording in the parallel student and teacher survey items, the gaps between the ratings were so significant that the teachers reached consensus that they didn’t really know their students as well as they believed they did and that the relationships were not as mutually positive as they had presumed.

While there was much in the school to feel proud about, the team soon acknowledged that greater emphasis needed to be placed on building relationships, taking an obvious interest in students and their future plans, and connecting their work in school to students’ world. The team discussed how they could introduce and describe these discrepancies and other information about student perceptions to their colleagues. As a result, they set up several teacher and student focus groups to examine the data together and expand the realization that there were meaningful differences in perceptions. This was an incredibly positive effort and, since then, Linda and her colleagues have been working to share practices to improve relationships and to take the initiative to listen to and learn about their students.

Linda gained a new appreciation of the value of student perceptions as one source of data to help teachers reflect on instruction. Linda and her colleagues took the opportunity offered by the principal to use the iKnow My Class survey to collect data from individual classrooms. The results gave Linda direct feedback on the students she was working with, and she did discover some differences and disconnects. For example, she found that some students remain very quiet in class while her attention is focused on the more active or disruptive students; the surveys gave her a more balanced perception of an entire
class. As a result of having the data, Linda was motivated to take a more proactive approach to instruction that built relationship and raised the level of instruction to higher rigor and higher relevance.

As her students settled in to begin work, she took pride in their increased engagement and eagerness to participate — and their perseverance in producing quality work. It all began with the systematic examination of student perceptions.

References

Chapter 10

Does Your Instruction Help Make Students Career Ready?

Curriculum defines what students will learn, and instruction defines how students will learn. A good curriculum alone does not guarantee student success. For high learning achievement, a curriculum needs to be executed by an effective teacher through effective instruction. This is especially true when considering the career readiness dimension of student achievement. Career readiness is a nuanced aspect of student learning that depends extensively on the quality of the instruction rather than the quality of the curriculum.

Teacher evaluation has become a data-focused initiative in schools. Using quantitative measures has become a significant part of overall teacher evaluation. Data ratings on instruction should be more than a static label; data collected and analyzed properly can also be used by teachers to improve instruction. The focus of this chapter is on how data can be used in improving one specific instructional aspect of student learning — namely, becoming career ready. Teacher evaluation ratings can useful data to reflect on whether instruction is making students career ready. For example, evaluation feedback that rates teacher performance on criteria such as engaging students helps to develop student commitment to continuous learning, essential to career readiness. But most of the teacher evaluation criteria focus on teacher performance and not enough on student classroom experiences that will shape career readiness. A deeper dive into data is necessary. In order to fully answer the question, “Does your instruction help make students career ready?” it is necessary to look at three aspects: data focus, data source, and data relevancy.

Data Focus
Data from teacher evaluations may be too broad to fully enable targeted improvement in instruction. Grading teachers in the name of evaluation usually takes the form of a rubric based on a comprehensive and very complex teaching framework and often factors in student test scores. This practice may yield a convenient teacher grade, such as effective or developing, but seldom yields data to inform instruction and help teachers. When using data to make an improvement such as changing instruction to increase student achievement, it is necessary to focus the data. Data should be available around a specific aspect of instruction, such as the quality of teacher questions, rather than evaluating a broader criterion, such as teaching strategies. When an instructional rating lumps together dozens of teaching practices, it is important to disaggregate the data to increase focus.

As an analogy, simply looking at a student’s overall test score may indicate that the student has not met the standard, but it does not tell a teacher about any specific changes that need to be made in order to increase achievement. By disaggregating the data and breaking down the student’s raw score into subparts, organized by instructional topics, the teacher has a narrower and better targeted data focus and can begin to identify skills that were not learned. The teacher can then consider how the specific topics were taught and how to address them differently or emphasize them more to prepare the student better in that skill area, thus increasing overall academic performance.
The same is true in instruction—an overall score in performance is interesting, but that score needs to be disaggregated in order to focus on aspects of instruction to improve. An overall rating on a teacher’s level of performance doesn’t indicate what the teacher might do differently to improve a rating. It is necessary to look at sub-scores within the framework of the rating criteria to determine any weaknesses in instruction. If sub-scores are not available, a more specific rubric needs to be developed or adapted. With such a rubric, a teacher may recognize that he or she rates low in, for example, giving students feedback or making students aware of the objectives of a particular lesson. Such disaggregated data gives teachers more information on specific aspects of their teaching on which they could focus.

Data Source

What data should be used to measure the quality of instruction? The answer to this question, in many minds, is a rating by an administrator sitting in to observe a teacher. For decades, this was the primary source of data on instruction. Rising concerns over the quality of schools led to increased accountability measures, which now call for using student achievement on standardized tests as a quality measure of instruction. After all, it should be results that are important! The argument is that, if the results are evident in students’ test scores, then instruction is effective. Data advocates love student test scores, because there are as yet few alternative measures that can provide reliable and valid information on the effectiveness of a teacher’s classroom practice (Kane). Nonetheless, using student test scores in teacher evaluation is still very controversial (Haladyna). For example, it is generally recognized that every classroom has students with varied abilities.

As a response, a number of states and local school systems have adopted value-added method (VAM) approaches to evaluate educators. VAM approaches use a statistical process that compares actual student achievement test scores to predicted scores (Harris). Teacher evaluation and use of the VAM accelerated in the Obama administration’s Race to the Top (RTTT) initiative, which required the use of student growth measures and the application of information from that data to make judgments about educator quality.

A third source of data on instruction is student feedback. As described earlier, the MET project (Measuring Effective Teaching), a national research study by the Bill & Melinda Gates Foundation, helps to give credence to the importance of student perception surveys. In this study to identify the best practices to support teacher evaluation (Bill & Melinda Gates Foundation), the three primary measures were examined: classroom observations, student achievement gains, and student perception surveys. The use of student perception data is also addressed in Chapter 9—What Are Your Students’ Perceptions about School?

There is a fourth data source that can be important as well—teacher self-reflection. After all, it is the teacher who is in the classroom everyday, sees every lesson, and knows very well what he or she intends to teach. Self-evaluation is a process by which teachers judge the effectiveness and adequacy of their performance (Ariasisan & Gullickson). Obviously, teacher reflection is not considered in evaluation, as it could easily be biased. However, when it comes to improving instruction, data created through teacher self-reflection can be the most powerful form of data-driven improvement of instruction, because the teacher himself or herself is making the observation and identifying the aspects of their instruction to focus on. Teachers can enhance self-reflection with structured tools and forms to move from opened-ended, general thoughts about whether a lesson was good or bad to actual data-driven reflection and improvement.
Data Relevancy
For decades, the answer to the question of how good a teacher is solicited subjective responses such as, “Her students are always well behaved.” “His students always do well on the AP exam.” “Parents always request that their children be placed in her class.” The people responding, whether it was a principal, peer, or parent, used their own criteria for judging a teacher. For some, classroom management was an important criterion; others chose to use student performance; and still others considered a caring disposition. Periodic administrator review of teacher performance usually included a locally-developed set of criteria that, again, required the supervisor to make subjective judgments of teachers’ strengths and weaknesses. These reviews were most frequently used in a teacher’s first few years of employment, leading to a decision on whether to grant the teacher tenure.

The recent explosion of teacher evaluation efforts has resulted in the emergence of numerous comprehensive frameworks that define effective teacher instruction. These evaluation frameworks, used by various states and school districts, all have a research or historical basis for validity. With a goal of consistency, the instructional elements in most frameworks define good instruction for all teachers, regardless of what is being taught or the characteristics of the students. Research defines several “effective” strategies (Marzano, et al.); however, instruction is not completely isolated from the students or curriculum.

Instruction is typically thought of as pedagogy — practices, strategies, and activities by which teachers facilitate learning. Instruction often includes a formal curriculum and a hidden curriculum. The formal curriculum is driven by standards and subject area content which defines what students are expected to learn. The characteristics of this curriculum often define appropriate instruction. The hidden curriculum consists of the unspoken academic, cultural, and social messages that are communicated to students while they are in school. Students often learn as much from the hidden curriculum as they do from the formal curriculum. In achieving the objective of career readiness, teachers need to consider not only the formal curriculum but also the hidden curriculum as part of their instruction. That is, teachers need to consider the subtle messages they convey as a result of how they teach and their conversations with students. Many of the skills and knowledge required to be career and life ready come from the messages transmitted by the way a teacher teaches and interacts with students.

The challenge of teaching for college and career readiness should cause us to pause and make sure we actually recognize the unique demands of adding career readiness to college readiness. Our education system is strongly focused on preparing of students to move to the next level of learning, with college readiness as the primary goal. All teachers have direct experience in preparing for and succeeding in college and have a clear understanding of what it means to be college ready. However, career readiness is a bit of a stranger to many teachers whose only career has been in education and who may have little or no interaction with employers as part of their teaching responsibilities.

Preparation for career readiness includes academic skills and, potentially, some technical skills. The defining characteristics of career readiness are the personal skills and work habits which contribute to students seeking a job, retaining their job once employed, and continuing education to enhance skills or prepare for a new job in a chosen career. Many of the skills and knowledge that define career readiness also equate to life readiness and reflect social-emotional well-being and a sense of community, responsibility, and initiative.
Future career success requires students to be creative, collaborative, and to critical independent thinkers with positive work habits. Achieving these 21st century skills is more about instruction than curriculum. Teachers need to design instructional experiences that encourage and reward these skills.

Current teacher evaluation models often overlook many of the unique instructional characteristics that contribute to career-ready and life-ready skills. A specific curriculum is less relevant in developing these abilities than how a teacher engages students in instruction. In order to determine the quality of instruction related to developing career readiness, it is important to specify data beyond formal teacher evaluations. There are some characteristics in teaching frameworks that do contribute to career readiness, such as facilitating student workgroups and giving regular feedback to students regarding their progress. But other career ready characteristics, such as creativity, may be overlooked.

When thinking about career readiness, the focus should be placed on skills and knowledge that must prepare students for the future and not on education that reflects past experience. In A Whole New Mind, Daniel Pink (2006) questions education traditions about the skills that are necessary to prepare students for a rapidly changing world. He offers six future needed skills that don’t fit neatly into traditional subjects: meaning, story, design, play, symphony, and empathy. Pink argues that while logical organized thinkers will always be needed, the future will require individuals who see the bigger picture, are able to be creative, and show strong empathy for others.

Howard Gardner is another thought leader who, over the past several decades, has introduced many new ideas for educators, particularly around multiple intelligences. In his book, Five Minds for the Future (2007), Gardner helps to stretch our thinking about the skills that students will need in our rapidly changing world. He describes the need for creating minds, synthesizing minds, disciplined minds, ethical minds, and respectful minds. Each of these references reinforces the notion of career readiness and life readiness skills that we hope for in our colleagues, our children, and our neighbors.

Another useful resource that speaks to the specific skills that cut across all careers and equate to life and career readiness are the Career Ready Practices from the Common Career Technical Core Standards, developed by the National Association of State Directors of Career and Technical Education Consortium (NASDCTEc). This work identifies 12 characteristics that most of us would agree are important for students to acquire:

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly and effectively and with reason.
5. Consider the environmental, social, and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership, and effective management.
10. Plan education and career paths aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural global competence.

These life or career skills do not come from a curriculum but from the way that teachers teach. There are also some life-ready skills that results from the way teachers relate to students in the classroom. A growing body of research points out how important social-emotional development is for student...
success. There is also an increasing awareness that teachers can proactively address the social-emotional development of students in the way that they conduct their instruction (Brackett, et al.). Teachers model positive social-emotional traits and give students feedback to reinforce their positive traits.

Another term that has captured educator interest is growth mindset from the book Mindset (Dweck). Carol Dweck’s research emphasizes that it is important to look at student achievement not from innate levels of intelligence, but from a student’s ability to persevere, work hard, and continue to learn. As educators, we often let terms creep into our vocabulary which imply that some students are smarter than others. While it is true that students have different abilities and strengths, if their impression is that an innate level of intelligence determines success, students often give up working in school when they encounter their first failure. Educators need to instill in students that success comes from effort rather than from native intelligence.

Another powerful book that aids understanding about how to engage students is Drive, also by Pink (2009). So much of educator behavior is driven by the perception that students are motivated with a combination of rewards and punishment—the old "carrot and stick" approach. Pink offers three better motivational strategies and supports them with research: purpose, autonomy, and mastery. These characteristics are also motivational to teachers and workers in any organization. Following Pink’s model, the way to truly engage students is to make sure they clearly understand the purpose — why they are learning and why it’s important. In other words, students need to understand the relevance of what they’re learning and how their education aligns with their future goals. Students need more autonomy in their learning. There should be choices in the work that students do to demonstrate their learning. This gives them more autonomy over their learning and more responsibility for it. Finally, students become very motivated when they can measure their mastery of learning in concrete terms. This aspect of true mastery conflicts with typical grading systems wherein students chase grades rather than learning. If student learning can be described in specific performances, presentations, writing, or research, then students have a more tangible way of describing their achievement. Further, it’s important to be able to show progress over time and actively involve students can measure the quality of their own work and progress toward their ultimate learning goal. All of these notions of competencies embedded within instruction need to be part of data collection to address relevant aspects of instruction for career readiness.

Examples of Reflections Data Measures
One of the initiatives of the Successful Practices Network’s CTE Technical Assistance Center is a new form of data-driven instruction that can trigger teacher self-reflection, inspire great teaching, and lead to continuous improvement. This initiative is a series of teacher reflection surveys based on the CAREER Instructional Model. CAREER is an acronym for six instructional elements that are essential 21st century skills and reflect cumulative effective teaching research:

- Connect with Relevance
- Assess for Proficiency
- Reward Creativity and Innovation
- Engage as Independent Learners
- Empower with Hope and Confidence
- Rate Work Habits and Collaboration
The CAREER Instructional Model is set up to be a simple synthesis of all of these complex ideas that relate to preparing students for the future. The CAREER model—along with the related surveys—gives teachers a set of tools that can inspire outstanding instruction and move beyond the minimum effective focus in teacher evaluation. These surveys are not a replacement for teacher evaluation frameworks, but rather a supplement to teacher evaluation which uses self-reflection data and focuses on teaching for career/life readiness. Discover more about the surveys and the CAREER Instructional Model <http://nyctecenter.org/instruction/cte-instruction>.

Teacher formal observations or informal walkthroughs are not very productive for improvement purposes when they use complex teaching frameworks with extensive rubrics. The rubrics often include all aspects of teaching, many of which are not used on a daily basis. Observation by an administrator through a series of classroom visits may give a valid representation of overall instruction, but it may not be particularly helpful to teachers when trying to keep in mind dozens of different parameters of teaching. In administrator walkthroughs and observations of instruction, a better practice is to focus on a single target that a school has committed to improving rather than on dozens of characteristics of instruction. This focus might be improving reading or increasing student engagement, for example.

A powerful target for improving instruction is to focus on rigor and relevance. This can be done through the International Center for Leadership in Education’s Rigor/Relevance Framework® <http://www.leadered.com/our-philosophy/rigor-relevance-framework.php>. This framework gives administrators and teachers a convenient way to quantify the level of rigor and relevance in instruction. Administrators doing walkthroughs can reflect on the learning experience in the context of the degree to which students are challenged by learning experiences with high levels of rigor and relevance.

Using the Rigor/Relevance Framework® to reflect on instruction can be supplemented with a teacher reflection survey. This survey quantifies the degree of rigor and relevance in their instruction without a formal external observation. Many teaching strategies contribute to high rigor and high relevance. Teachers need to decide when to use these strategies based upon the content they are teaching and the needs of individual students while constantly seeking to raise the level of rigor and relevance. Teachers use the reflection survey to answer a few statements about the strategies they most frequently use and characteristics of their instruction. The survey uses an algorithm to create an overall rating and gives the teacher a quantifiable measure of the degree of high rigor/high relevance instruction. The survey is supplemented with a set of recommendations of individual strategies teachers might consider toward increasing rigor and relevance. This rigor/relevance reflection survey is available through the NYS CTE Technical Assistance Center web site <http://nyctecenter.org/instruction/cte-instruction>.

A Scenario

Tony Evans is a 5th-grade math teacher who believes he is an effective teacher. His students perform well on state assessments and get good grades in math. He is frequently complimented by administrators on the way that his students conduct themselves in class.

In a recent schoolwide professional development workshop, the presenter referred to several videos that teachers might want to watch as part of their professional learning. One topic that interested Tony was a video by Sir Ken Robinson entitled, “How Schools Kill Creativity.” Tony watched the video, and it caused him to think about his teaching and whether he was stifling his students’ creativity. While Tony felt successful as a teacher, he began to feel a bit uncomfortable that perhaps he’d fallen into a routine
of just getting students ready for the next level of mathematics and making sure that they scored well on the state test.

At the next meeting of his grade level team, Tony shared how he felt after watching the video on creativity. A colleague mentioned that she had seen the video as well and felt similar to Tony that perhaps they could do more relative to student creativity. They began to look for resources and found articles and blogs to read. They also discovered a teacher reflection survey, the CAREER Instructional Model, which they could use to think about their own instruction. The survey asked teachers to indicate characteristics of their classroom and then give themselves a score on their practices to reward creativity and innovation in the classroom. Tony introduced the survey to the team, and they all agreed to take it and come back a week later and to talk about the results.

When Tony took the survey, he was concerned to see that his rating was relatively low on the 10-point scale used. In discussing the survey with his colleagues, he found that many of them also had low scores, except for Jean Hernandez, the social studies. The group asked Jean to describe some activities she included in her instruction, which revealed her strong emphasis on creativity. This discussion and the categories of actions in the survey helped the team begin to identify instructional practices to work on. As a result of their brainstorming, each of them had three or four ideas of how they might change student work to introduce creativity.

One of the things Tony decided to do was open each class with a real-world problem that required math to solve. Students struggled with these problems, which often reached beyond their current math skills. He was impressed with the ideas they came up with to try to solve the problems. This math challenge often became the most interesting part of the class. Tony also started having students suggest another way to solve a math problem after watching a student demonstrate a correct calculation on the board. This reinforced the fact there could be multiple ways to get to an answer.

Adding creativity to instruction was not accomplished with one small change, but the team was committed to placing this emphasis in their curriculum. They continued to share activities that worked well and some that were less than successful. The support and encouragement of peers was a positive influence for thinking about how they could change their instructional efforts. Even more gratifying, they began to notice an increasing level of student engagement. Tony was convinced that adding creativity better prepared students for the uncertain challenges that lay in their future. This change was also helping him to become a better teacher.

<table>
<thead>
<tr>
<th>KEY POINTS</th>
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<tr>
<td>• Select a teacher reflection survey tool that is focused and relevant to aspects of instruction targeted for improvement.</td>
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<tr>
<td>• Complete the survey and identify strengths and areas in need of improvement.</td>
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<tr>
<td>• Reflect on teaching strategies that could be changed.</td>
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<tr>
<td>• Discuss with colleagues and/or mentor results of survey and planned actions.</td>
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<tr>
<td>• Implement changes.</td>
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<tr>
<td>• Complete survey at a later time and reflect on improvements.</td>
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References
Chapter 11

Are Your Students Successful in Career and Technical Education?

Career and technical education (CTE) traces its roots back over a century in the U.S. education system, beginning as an option in secondary schools for some students to acquire practical, hands-on skills. The skills were useful on the farm or in the home at a time when many people lived on farms and home life required a myriad of skilled physical tasks for preparing food, making clothing, and building shelter. Our home lives and jobs have changed markedly over that century and so too has CTE. Today’s secondary programs teach skills in dozens of career fields with a focus as much headwork as handwork. This sophistication of CTE blurs the lines between traditional academic education and CTE. CTE teaches high levels of communication, computation, and technical skills, along with employability skills. Many CTE programs require continuation in postsecondary education to complete preparation for entry into the workplace in well-paying and in-demand jobs.

Data Measures for CTE
The broad purposes of CTE are to develop technical and employability skills leading to jobs and a career. The challenge in evaluating participation in CTE is that it does not have a uniform depth of instruction across its many occupational areas. Programs vary considerably in length and intensity. Another variable is that the intensity of students’ participation in CTE varies greatly. For example, some students enroll in only one or two courses of interest, while other students take the equivalent of eight courses over several years. It is unrealistic to expect students who have made a casual exploration of CTE to have the same achievement results as students who have had intensive CTE experiences.

Another challenge is defining what constitutes CTE. Many schools have created interdisciplinary courses that include elements of CTE but may or may not be considered CTE in their definition. For example, an advanced science course in animal physiology may be considered a science elective, but could also be part of a veterinary assistant CTE program.

In all cases, whether students take a single course as an elective or a multi-year intensive program, CTE should be evaluated on the degree to which it enhances their development and achievement. CTE is an investment by the community through broader education offerings and an investment in time by the student. There should be a demonstrable benefit to those investments.

An initial question is whether a school is offering the most useful career areas in its CTE courses and programs. There is a tendency to continue to offer CTE in areas for which a school already has existing staff, rather than considering changing to another curriculum when it might require changing staff. Chapter 7 — Are You Preparing Students for Viable Future Careers? explores how labor market data should be used to align career-related instruction to growing career fields.

Career and technical education differs from academic subject areas and has its own unique assessment and data characteristics (Foster, et al.). For example, an academic assessment often emphasizes
student’s ability to recall or apply knowledge. A CTE assessment also requires a knowledge component but must also include performance assessments.

One unique purpose of CTE is to develop technical skills. Therefore, one of the data measures of CTE success is assessment of acquisition of technical skills. Academic assessment often emphasizes students’ ability to recall or apply knowledge through an objective written assessment while CTE assessment emphasizes demonstration of technical skills through some performance. This poses three problems for local schools.

1. The CTE expectation for performance-based assessment may not be easily administered in school schedules and setting. Performance-based assessment often requires more time, facilities, and resources to properly assess student proficiency. Flexibility needs to be provided in time, staffing and location to administer CTE assessments.

2. School grading systems are often not designed to handle reporting data on both written assessments and performance assessments. Schools should examine grading practices to ensure that both written and performance assessments can be appropriately reported in grading systems.

3. The diversity of CTE programs and courses makes it difficult to locate commercially available and valid assessments that align with every instructional program. This problem is easing somewhat through the NOCTI (<http://www.nocti.org>) and CTECS (<http://www.vtecs.org>) testing consortia and the growth of industry-sponsored certification programs.

When developing local technical assessments, there are several considerations to keep in mind. Most important, don’t let the existing grading system dictate the form of the assessment. Refer to Chapter 5 — *How Do You “Grade” Student Work on Performance Assessments?* to examine effective grading practices for these types of assessments. Also, don’t be trapped by traditional percentage grading and assume that if you give a written test related to technical skills, students should get 65% of those questions correct to “pass.” Sixty-five is just an arbitrary number, based on tradition, and may not be the appropriate passing score for every test. Instead, once you develop a local technical assessment, validate it by having it reviewed by other adults proficient in those skills or working in that career field. Let this group of experts determine the “cut score” of what achievement level students should meet on this assessment to be considered proficient.

Another unique purpose of CTE is learning of employability skills. This includes the skills around planning for a career, seeking a job, securing a job, and maintaining that job. These skills are often best assessed through a specific competency list and rating by a teacher or employer using a rubric, as discussed previously. This competency profile is often called an employability profile. Employability skills are the generic skills that apply to all careers and a common set of employment competencies that might apply to all CTE programs. An employability profile may or may not also include the technical competencies that a student has acquired.

In addition to data related to what students actually learn in CTE is data on student performance as a result of participating in CTE. The hypothesis is that participating in CTE enhances overall learning and especially engagement. Examining data on several such characteristics/outcomes can be useful for measuring the success of CTE. As you collect this data, be sure to follow proper research practices when comparing data. For example, since students are not randomly assigned to CTE programs, it is not valid to compare performance of CTE students to other students. It may be necessary to try to match CTE students to peers, using some additional data, in order that a valid data comparison can be made.
The following chart shows some of the educational benefits to students that should result from participating in CTE, along with data measures that can be used to quantify those benefits.

<table>
<thead>
<tr>
<th>Benefits to Participation in CTE</th>
<th>Data Measures</th>
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<tr>
<td>Deepen Academic Skills through Application</td>
<td>Student Assessment Scores in English Language Arts</td>
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<td></td>
<td>Student Assessment Scores in Mathematics</td>
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<td>Increase Student Engagement</td>
<td>Attendance</td>
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<td>Student Perception Surveys</td>
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<td>Increase School Completion</td>
<td>Cohort Graduation Rate</td>
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<td>Persistence to Continue Education</td>
<td>Postsecondary Enrollment</td>
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<td>Postsecondary Enrollment Two Years after High School</td>
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**Federal Accountability Requirements**

Accountability in CTE is heavily influenced by federal legislation, since most CTE programs are funded in part by federal funds. The current federal legislation is the *Carl D. Perkins Career and Technical Education Improvement Act of 2006*, referred to as Perkins IV. Under this legislation, states are called upon to provide data that show how CTE students attain related skills. Under previous legislation, states could devise their own means to measure achievement. A common way to do so was to document grades, such as considering students who earned a “B” or better in an exit level CTE course to have met the required performance indicator standard for skill attainment. Today, the emphasis is placed on third-party assessments developed and monitored by an outside source, such as NOCTI or CTECS. The tests are validated by the vendor, and states or districts contract with the vendor to purchase and administer the assessments to students. Third-party assessments are part of the much larger picture of credentialing, by which students earn an industry-based or other credential upon successful completion of an exit-level course.

Federal accountability requirements define the data that must be collected and reported on CTE students. This data is important for state accountability requirements, and it has to be collected accurately. The first question to address is which students should be included. Since enrollment in CTE is optional in most schools, the initial step is to define clearly who is a CTE student. Federal definitions identify two categories:

*CTE Participant*: A secondary student who has earned one (1) or more credits in any career and technical education (CTE) program area.

*CTE Concentrator*: A secondary student who has earned three (3) or more credits in a single CTE program area (e.g., health care or business services), or two (2) credits in a single CTE program area, but only in those program areas where 2 credit sequences at the secondary level are recognized by the State and/or its local eligible recipients.

The following are the eight secondary school data measures that are used in federal CTE accountability (U.S. Department of Education, Office of Vocational and Adult Education, 2007) expressed as percentages. States have various procedures to collect this data from schools. Note: Educators in New
York State should refer to the New York’s Student Identification Repository System (SIRS) <http://www.nyctecenter.org/spn/page/10> which describes procedures for properly reporting results in CTE.

1S1 — Academic Attainment in Reading/Language Arts
   Numerator: Number of CTE concentrators who have met the proficient or advanced level on the Statewide high school reading/language arts assessment administered by the State and who, in the reporting year, left secondary education.
   Denominator: Number of CTE concentrators who took the ESEA assessments in reading/language arts whose scores were included in the State’s computation of AYP and who, in the reporting year, left secondary education.

1S2 — Academic Attainment in Mathematics
   Numerator: Number of CTE concentrators who have met the proficient or advanced level on the Statewide high school mathematics assessment administered by the State and who, in the reporting year, left secondary education.
   Denominator: Number of CTE concentrators who took the ESEA assessments in mathematics whose scores were included in the State’s computation of AYP and who, in the reporting year, left secondary education.

2S1: Technical Skill Attainment
   Numerator: Number of CTE concentrators who passed technical skill assessments that are aligned with industry-recognized standards, if available and appropriate, during the reporting year.
   Denominator: Number of CTE concentrators who took the assessments during the reporting year.

3S1: Secondary School Completion
   Numerator: Number of CTE concentrators who earned a regular secondary school diploma or a State-recognized equivalent to a regular high school diploma.
   Denominator: Number of CTE concentrators who left secondary education during the reporting year.

4S1: Student Graduation Rates
   Numerator: Number of CTE concentrators who, in the reporting year, were included as graduated in the State’s computation of its graduation rate.
   Denominator: Number of CTE concentrators who, in the reporting year, were included in the State’s computation of its graduation rate.

5S1: Secondary Placement
   Numerator: Number of CTE concentrators who left secondary education and were placed in postsecondary education or advanced training, in the military service, or employment.
   Denominator: Number of CTE concentrators who left secondary education during the reporting year.

6S1: Nontraditional Participation
Numerator: Number of CTE participants from underrepresented gender groups who participated in a program that leads to employment in nontraditional fields during the reporting year.
Denominator: Number of CTE participants who participated in a program that leads to employment in nontraditional fields during the reporting year.

6S2: Nontraditional Completion
Numerator: Number of CTE concentrators from underrepresented gender groups who completed a program that leads to employment in nontraditional fields during the reporting year.
Denominator: Number of CTE concentrators who completed a program that leads to employment in nontraditional fields during the reporting year.

The Future of CTE
CTE has changed significantly over the last century, and it will continue to evolve. At a school level, there are two aspects to keeping pace with this change:

1. School staff need to stay current with federal CTE legislation and state procedures for distribution of funds and school accountability.
2. Maintaining strong support for high quality programs in CTE depends on having accurate data. Too often data is incomplete or inaccurate, which makes it difficult to form state and national policy.


(1) **Alignment.** Effective alignment between high-quality CTE programs and labor market needs to equip students with 21st century skills and prepare them for in-demand occupations in high-growth industry sectors

(2) **Collaboration.** Strong collaborations among secondary and postsecondary institutions, employers, and industry partners to improve the quality of CTE programs

(3) **Accountability.** Meaningful accountability for improving academic outcomes and building technical and employability skills in CTE programs for all students, based upon common definitions and clear metrics for performance

(4) **Innovation.** Increased emphasis on innovation supported by systemic reform of state policies and practices to support CTE implementation of effective practices at the local level.

Finally, schools need to focus on data collection and research regarding their CTE programs to assist in making decisions regarding the benefits resulting from their investment in CTE.
KEY POINTS

- For schools offering CTE programs under the state distribution of Perkins federal funds, establish data collection and reporting systems to comply with procedures
- Determine which students enrolled in CTE will be counted as CTE concentrators
- Develop local measures to assess CTE technical and employment skills and knowledge.
- Conduct data analysis to determine enhancement in student achievement from participation in CTE programs

References
Life/career abilities are sometimes referred to as “non-cognitive skills”, “employability skills”, “soft skills” or “socio-emotional skills”. No matter the nomenclature, they are the skills that make someone resilient, tenacious, sociable, personable, reliable, nimble, confident, self-aware, self-regulating and armed with the grit necessary to navigate life and career in a rapidly changing world.

At Successful Practices Network, we prefer to call them life/career abilities. This is because we find it a misnomer to refer to these skills as “non-cognitive skills”. This is because, in fact, to gain, evolve, and be able to adeptly and flexibly apply these skills in a variety of scenarios requires high-level cognition. In addition, when using the term “employability skills” with school audiences, there is a tendency to consider such competencies to be primarily - or even exclusively - the responsibility of career and technical education rather than that of the entire school. This misconception is because many academic teachers do not consider their work as readying students for employment. We consider social-emotional, non-cognitive, employability skills and soft skills to be synonyms for the same types of skills sets and attitudes, but will, for our purposes, refer to them as life/career abilities.

The use of data is so commonplace in our society that we often take it for granted. It is data that makes communication and transactions easier. The instant communication of the Internet is possible because of underlying data systems. Even though, we use the Internet to communicate subjective opinions and emotions, these emotional words and images are all translated into data to easily share with others. Our monetary system is based upon standard quantities, which make it easier to place values on goods and services and to negotiate transactions when buying and selling. Clothing sizing is another example of how data has helped us standardize; we are able to select clothes by size, which makes shopping more efficient. In short, data enables us to quantify, make evaluative judgments and improve most decision-making processes.

Placing data on seemingly complex student behaviors, mindsets and work habits is difficult, but not impossible. However, it is difficult, if not impossible, for a school to move toward sustainable improvement if school leaders do not have a good idea of what is actually happening in their classrooms and with their students. For educators, data is essential for:

- **Planning**: Planning processes are more efficient and effective using data. Imagine trying to open a school without knowing how many students might attend. A school must know the numbers of students as well as the characteristics that those students bring to learning. Successful education leaders use data effectively to plan for meeting student needs.
- **Goal-setting**: Effective organizations have specific goals that they work toward. In the case of schools, it is essential to establish quantitative measures for what a school expects to accomplish for its students.
- **Progress measurement**: A school can and should periodically measure results to determine where it has been successful and where it needs to strive for greater improvement.
- **Evaluation**: Data is used to evaluate various school and classroom practices, including the effectiveness of instruction. When a new initiative is introduced, educators must determine whether it is effective by using data to evaluate results.
- **Communication**: Education serves many constituencies in addition to school staff and students.
Schools must communicate with parents, taxpayers, community members and leaders, state agencies, and the federal government. Including data as part of that communication process is not only efficient, but also effective in reaching the various stakeholder groups.

Using data effectively with respect to life/career abilities, involves several data touch points. These touch-points can be described in two broad categories: school and classroom.

1. Across the School category includes school-wide measures that leadership teams should focus on to set goals and measure progress.
2. The In the Classroom measures are tools for teachers to support developing Life/career abilities though student learning experiences.

ACROSS THE SCHOOL

Learning Criteria

SPN created a conceptual framework called the Learning Criteria for 21st Century Learners as part of a five-year research grant in partnership with the International Center for Leadership in Education and the Council of Chief State School Officers and with support from the Bill & Melinda Gates Foundation. This project identified, analyzed and disseminated the nation’s most successful school-wide practices and policies for achieving a rigorous and relevant curriculum for all students, with a particular focus on classroom instruction and effective learning. SPN has revised the Learning Criteria to better reflect what it means to prepare students to be career ready as well as college ready.

The original Learning Criteria was important in drawing attention to the fact that schools need measures of both “stretch learning”, which requires moving beyond simply meeting minimum requirements as defined by state tests and district/school requirements, as well as the development of “personal skills”. These criteria, along with traditional academic measures (foundation learning) and a fourth measure of “student engagement”, provided a useful model for designing and implementing intentional learning experiences and a culture conducive to increasing emphasis on “soft skill” development. The renamed and revised Learning Criteria for College and Career Readiness (2014) that has subsequently been adapted and adopted by SPN identifies three broad domains of a student’s experience in school:

- **Academic (“know”) - Measures of what students know, organized around the traditional core subjects of English language arts, mathematics, science and social studies**
- **Performance (“do”) - Measures of what students can do including technical, artistic and/or athletic performances, as well as their ability to apply academic knowledge to solve problems**
- **Life/Career Abilities (“be”) - Measures of who students are, as reflected in their personal skills and interests, interpersonal skills, work habits and career planning skills.**

This revised Learning Criteria does not neglect the original notion of indicators around learner engagement and stretch learning. Learner engagement and stretch learning are now subcategories, or dimensions, in each of the three domains, as is foundation learning.

- **Learner Engagement: the degree to which students exhibit behaviors and decisions that demonstrate an interest in and commitment to learning**
- **Foundation Learning: core knowledge and skills required of all students as the minimum level of achievement**
- **Stretch Learning: opportunities to extend and enhance learning in areas of students’ talents and interests**

The Learning Criteria model defines a process for schools to engage in redefining broader, school-wide measures for student growth and achievement, with an emphasis on quantifiable measures of learning that includes life/career abilities.
School Self-Assessment

For more than a decade, SPN has been conducting school and district assessments as a means of supporting school leaders in their improvement efforts. This experience has helped us to develop an array of tools, which now comprise a resource called the Career Readiness Self-Assessment.

The Career Readiness Self-Assessment is an easy-to-use array of checklists designed to allow school leaders and staff members to assess the career readiness of their students and related practices - as well as other aspects of student learning and development. The assessment is comprised of checklists that enable and empower educators to:

- assess the practices in place to promote life/career readiness
- examine aspects of school culture that support or inhibit achieving life/career readiness
- evaluate the results of these processes through the assessment of student readiness.

The entire process is valuable, including allowing the school leadership team to reflect on achievement and effectiveness using, if so desired, all thirteen checklists, including Career Readiness Instructional Practices, School Culture and Student Learning Results. That said, two of the checklists directly relate to quantifying school performance related to the development life/career abilities.

- First, one of the instructional practices checklists addresses the topic of life/career abilities development in classroom practice.
- Second, one of the Student Learning Results focuses on life/career abilities student success.

These two checklists specifically enable school leadership teams to quantify their practices and results related to life/career abilities using the self-assessment rubrics.

The Extra-curricular Curriculum

There is a legitimate education-related reason why schools offer sports, clubs and other extracurricular activities as part of students’ learning experience. These activities provide opportunities for students to:

- develop social skills,
- be exposed to more of the world beyond school
- work with others to accomplish a goal, and
- develop perseverance through competition.

These rich learning experiences are some of the best existing ways that students develop life/career abilities in school. This is why schools and parents insist on offering these experiences, even when resources are limited or they may “interfere with” academic instruction. Some of students’ most valuable learning is derived from relationships, struggles and achievements in non-academic learning experiences. Further, these extra-curricular activities increase student engagement, aid in drop-out prevention and improve attendance.

Quantifying the student learning in the realm of life/career abilities can be elusive. However one simple way schools can collect data in this domain is to keep track of which students and what percentage of students, over time, participated in sports, held a leadership or membership role in a club, were part of a competitive school- or intramural team, engaged in work-based learning or engaged in service learning. There is no guarantee that every student that participates in such experiences will develop positive life/career abilities, but there is certainly ample intuitive, teacher-observed, and research-based (e.g. Eccles, 2003) evidence of a strong correlation. An excellent school-wide measure of success in developing
students’ life/career abilities is to strive for an ever-increasing number of students that participate in these experiences. Some schools even require participation in service learning experiences.

**Student Recognition**

Schools have traditionally deployed student academic recognition practices (such as honor role, honor society or wearing high academic chords on the graduation gown) to celebrate academic achievement. Schools that strive to make Life/career abilities an important learning domain, also use parallel ways to reward and model student achievement (such as recognizing leadership, service, kindness, or effort). Doing so may not be as simple as ranking grade-point average and should be also be broad and flexible enough for students to earn recognition for a variety of experiences that demonstrate different Life/career abilities. For example, there might be points awarded for different types of non-academic experiences, participation rates, and achievements.

Nominations and recommendations from teachers, coaches, faculty advisors and even fellow students could also be included. Each student who accumulates enough points through effort, attitude, experiences, and demonstration of positive traits could be recognized with a designation of achievement. Some schools already hand out single awards that might be designated as

Character or Service Awards to individual winners. This broader form of recognition would include different “criteria-based” measures (e.g. extracurricular participation, attendance, proactive effort, collegiality, demonstrated acts of kindness or support, etc.) and every student meeting those standards would be recognized. Schools could track the number of students earning such recognition over time and set goals for improvement.

**IN THE CLASSROOM**

**Formative Feedback**

John Hattie (2012), in his groundbreaking meta-analysis research, has made clear that feedback is one of the most effective instructional strategies. Feedback includes telling students what they have done well, and what they need to do to improve; but it also includes clarifying a target of excellence. Feedback is especially important when focusing on this learning domain of Life/career abilities. Fortunately, many teachers do give informal and impromptu feedback, but primarily by way of brief, subjective comments, such as, “Nice job” or “Well done.” What is clear from Hattie’s research is that the feedback should be tied to giving students the assessment criteria included in the feedback. High-quality feedback should always be given against a context of explicit criteria. By using well-defined analytic rubrics, teachers can help students understand the desirable behaviors that are expected. It is more effective to have students view their behavior as a learning experience to aspire to, rather than be used a punitive shame-based system – one that has increasing levels of “punishment” based on levels of poor or unacceptable behavior (Shindler, 2009).

In order to have effective systems of feedback on Life/career abilities, teachers need to have convenient and easily understood rubrics that students can comprehend at their own conceptual and vocabulary (and overall reading) levels. To assist schools in developing rubrics, SPN has developed a Life/Career Competencies Rubrics, which includes four level descriptions of student proficiency in nearly 100 different behaviors in the Life/Career Abilities Framework http://nyctecenter.org/instruction/life-career-abilities. Teachers can select appropriate rubrics to use from this resource.

Teachers also need to purposefully and intentionally design and provide learning experiences in ways that
students have opportunities to demonstrate the desired behaviors. For example, teachers are unable to give students feedback on the behavior of collaboration if the student work is always individual and students are never expected to collaborate. Teachers should reflect on the learning experiences they design to make sure these experiences are designed to provide opportunities to demonstrate life/career behaviors.

**Self-Reflection**

One of the recommended practices in using rubrics as formative assessment is allowing students to reflect on their work prior to teacher evaluation and feedback (Goodrich, 1996). The same applies when using rubrics to evaluate behaviors related to Life/career abilities. By using the rubrics, students can reflect on a level of behavior on a quantifiable scale and thus are better informed and more likely to see potential to improve behavior over time to a higher level. Without a quantifiable rubric, students often see their behavior as good or bad. Good is acceptable and bad is punished. Moreover, many students lack the value and guidance provided by an objective scale of acceptable behaviors and therefore self-assess themselves as either more or less capable than they really are. Such either/or approaches rarely result in meaningful behavior modification efforts and likely reduces – not increases - students taking fuller responsibility for their behavior. The use of a quantifiable rubric uses data to increase the likelihood of students beginning to more thoughtfully reflect on behavior and attitude. Use the SPN Life/Career Competency Rubrics http://nyctecenter.org/life-career-competencies-framework to assist students in reflecting on these essential behaviors.

**Grading Practices**

A number of education researchers recommend doing away with including behavioral factors in student achievement grades (O’Conner, 2010). However, it is still too common a practice in many schools for teachers to raise or lower grades because of either positive or negative attitudes or behaviors. The reason this practice persists is that grading is one to the few controls that teachers have over students and the threat of lowering a grade (that most students still feel is important) may be enough incentive to modify behaviors in the short term. The problem with this practice is that it distorts the academic grade as an indication of what a student has learned. It also provides limited feedback on student development of the desired behaviors. One alternative is to still assign grades for behavior, but keep them separate from measures of students’ academic performance (Wormeli, 2006). Having separate behavior grades is important in Career and Technical Education where work habits are critically important.

**Summary**

Life/career abilities should amount to more than telling “one of” the stories or sharing romanticized anecdotes about the successes of a few individual students. The domain of life/career abilities need to be addressed and developed for all students, not only for employability reasons, but also for their success in further education and in adult life as responsible adults and contributors to the betterment of society.

Schools and teachers can (and need to) become more intentional and systemic in the development of life/career abilities by introducing several of the data measures described previously to focus across the entire school to measure in this critical domain of school improvement. Good teachers do influence the development of student mindsets and behaviors. However even good teachers can become better at doing so by quantifying their work with some of these suggestions for employing the use of data.

It is time to “measure what matters” in relation to life/career abilities.
References


Chapter 13

How Do You Know Your Students Are Career Ready?

Answering the question regarding whether students are career ready is much more complex than identifying a single data reference or a single learning experience. Single measurements are very appealing to educators and the general public because of their simplicity. There is a level of comfort in traditional simple measures, such as “Your IQ is 115.” “Your child performs at level 3 on the state mathematics assessment.” “Your Lexile reading comprehension level is 1050L.” Simplicity is convenient; however, it can also be misguided when attempting to define student achievement, particularly in something as complex as career readiness.

To prepare a student to be career ready requires many school experiences. Career readiness is the gradual accumulation of learning experiences over several years. These multiple experiences are difficult to capture in a single statistic. Readiness also varies with the individual. A student with a goal of becoming a firefighter might be ready to begin pursuing specialized training for this career immediately after high school. Another student might have career aspirations to become a civil engineer, which requires additional years of formal education. It is difficult to compare, with a single measure, students’ degree of career readiness based on high school completion. College readiness is more easily defined. When schools refer to “student readiness for college and career,” this is usually described as ready to benefit from college level work without remedial courses; career readiness is ignored. Although career readiness is more complex and individualized, it should not be overlooked. Schools should identify multiple statistical measures of career readiness. By embracing multiple measures, schools can assess, analyze, and strive for student career readiness as well as college readiness.

There are several distinct categories of data that are helpful in understanding the multiple measures that should be used in a data display of career readiness. This breadth of data is similar to the information provided Chapter 2, Are You Measuring What Matters? which provides many examples of student achievement data. In this chapter, the focus is specifically on the appropriate data for skills and knowledge that relate to career readiness.

Defining Career Readiness

There are several definitions of career readiness, and adopting a local definition is an important first step to collecting data around this aspect of student learning. Some states have designated a career readiness measure. One example is the ACT WorkKeys. This assessment measures application of basic skills and reports out levels of student achievement. However, there are many additional aspects of career readiness beyond the application of these core academic skills. David Conley from the Center for College and Career Readiness defines four keys that encompass student learning for college and career readiness. These are: key cognitive strategies, key content knowledge, key learning skills and techniques, and key transition knowledge and skills (Conley).
• Key cognitive strategies include skills such as problem formation, research interpretation, communication, and precision and accuracy.
• Key content knowledge includes structure of knowledge, challenge level, value, attribution, and effort.
• Key learning skills and techniques include ownership of learning techniques.
• Key transition knowledge and skills include postsecondary/career awareness, postsecondary costs, matriculation, role identity, and self-advocacy.

The Career Readiness Partnership Council (2012) defines career readiness as:
A career-ready person effectively navigates pathways that connect education and employment to achieve a fulfilling, financially-secure and successful career. A career readiness has no defined endpoint. To be career ready in our ever-changing global economy requires adaptability and a commitment to lifelong learning, along with mastery of key knowledge, skills and dispositions that vary from one career to another and change over time as a person progresses along a developmental continuum.

The Association of Career and Technical Education (2010) states that career readiness involves three major skill areas:
1. *core academic skills* -- and the ability to apply those skills to concrete situations in order to function in the workplace and in routine daily activities
2. *employability skills* -- such as critical thinking and responsibility, which are essential in any career area
3. *technical skills* - job-specific skills related to a specific career pathway.

Any definition of career readiness is likely to include the foundational skills of reading, thinking, and communicating. In addition, all secondary schools include core academic knowledge in the broad areas of science, mathematics, literature, history, and geography, which are important for career readiness. There are also a number of performance skills relating to technical aspects of careers which are essential for defining talents/interests and pursuing careers. Finally, a category of skills that is critically important to careers (and college readiness as well) includes personal skills, teamwork, and other work habits and attitudes. “Readiness” is also defined by participating in school experiences, such as a developing a career plan, engaging in work-based learning, and taking leadership responsibilities in extracurricular activities.

Any identification of data used to define career readiness needs to include a number of these skill areas that cross multiple subjects and courses. A useful metaphor here is thinking about weightlifting. A student might be proud about the fact that he or she can bench-press 200 pounds. This gives specific data about bench-pressing strength that may be impressive to a variety of audiences. However, the number alone does not tell enough about whether that individual has the strength and conditioning that could support high-level performance in a variety of sports. This example of bench-pressing using a single specific level is an instance of a *rating* performance, similar to how a state assessment of reading comprehension might identify a rating of a student’s comprehension, such as level 3 on a 4-point scale. Discussions of data-driven education often focus on this aspect of a rating by assigning students a particular value on a scale and measured against a benchmark level.

There are actually four types of data that need to be considered in career readiness. In addition to rating, binary, quantity, and quality are useful data measures. It is important to avoid limiting definitions of career readiness to a *rating* only.
<table>
<thead>
<tr>
<th>Data Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>Numerical Value on Scale</td>
</tr>
<tr>
<td>Binary</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Quantitative</td>
<td>Numerical - Open-ended Maximum</td>
</tr>
<tr>
<td>Qualitative</td>
<td>Numerical on Rubric or Narrative</td>
</tr>
</tbody>
</table>

- **Rating** is a designation of student performance on a scale. It’s important to know the value as well as the scale.
- **Binary**, also called “true/false,” indicates whether the student has or has not had a particular experience in school. Binary ratings are simply a yes/no response; there is no range of performance.
- **Quantity** data identifies the accumulation of a quantity by which you can compare students to one another or compare students or to a minimum performance based upon the total quantity of experiences they have completed. An example of this is the number of courses completed. Two students may have both met the minimum requirements for a diploma, but one may have many additional credits beyond the minimum.
- **Quality** data reflects a certain degree of subjective analysis that can give a better picture of student achievement. It may or may not be a numerical value.

Let’s return to the weightlifting analogy to examine how these four categories of data might be useful in fully describing the training and conditioning of a student. The bench-pressing value is an example of a rating. Appropriate binary data might be to indicate whether a student is involved in a regular supervised weightlifting training program. There is considerable difference between bench-pressing a certain weight at a single time and participating in weightlifting as a regular activity. The quantity value might be documentation of how often the student participates in weightlifting, for example, 45 minutes three days a week. It might indicate the number of repetitions of lifts at a specific weight. That quantity could also identify the breadth of weightlifting exercises which the student does, such as those that relate to arms, legs, etc. Finally, a qualitative data assessment of weightlifting could have documentation from a certified trainer that a student has completed the weightlifting exercises in a correct manner in order for them to achieve the desired effect in improved conditioning. Thus, a fuller data description of the weightlifting might include identification of whether the student is in a regular weightlifting experience, the frequency of weightlifting, the range of weightlifting experiences in which the student engages, documentation from a certified trainer that weightlifting is done correctly, and the rating of the weights a student is able to lift. A broader set of data in these four categories paints a richer picture of student conditioning than simply stating a rating; the student can bench-press 200 pounds. The same is true for career readiness. It’s important to look at data in each of these four categories and examples of measures that could be used.

**Ratings**
Ratings are the area of student data with which educators are most comfortable. There are several rating-type assessments that are suitable for career readiness. One is a rating on a technical assessment. Dozens of technical assessments are appropriate for secondary education. Sometimes the technical
assessment will be part of earning an industry certification; often it is the standardized assessment for a technical skill area.

State academic assessments usually report out in ratings. This could include academic assessments that are required for graduation or school accountability state assessments. There may also be applied academic assessments or technical assessments that are available within a state to use to describe students academic achievement. Several national assessments that would be appropriate are:

- ACT WorkKeys
- ACT Test
- College Board SAT

### Binary Data

Examples of binary (true/false) data that could be used to assess career readiness are whether the student has earned specific industry certifications or badges. There are a number of industry certifications, such as the A+ certification for computer networking, a state license for cosmetology, ProStart certification for food handling, and a AWS welding certificate. There are literally hundreds of established certifications that may come from a national professional organization, industry group, or state licensing system that students might achieve through various objective assessments and performance assessments.

Badges are a growing trend, particularly where skills are related to Internet-based competencies such as web development, graphic design, or programming (Abramovich). Badges are usually offered by an institution or accrediting group to identify the accumulation of specific skills. In identifying the data for career readiness, a student’s transcript could merely indicate “yes” or “no” as to whether students have acquired some of these credentials, or badges.

A final example of binary rating is whether or not a student possesses a career plan. A career plan would include documentation of the student’s personal interests and talents, an examination of potential career fields the student might wish to consider, and education plans that would move the student toward a particular career goal. A career plan is not a rigid prescription that defines a single future job choice and the education courses to prepare for that job, but a written artifact that a student has engaged in thoughtful planning with adult supervision in considering future education and career plans. A dynamic career plan can change and should be revised as a student’s experiences evolve.

### Quantitative Data

The development of proficiency towards career readiness includes an accumulation of experiences throughout a student’s K-12 education. In secondary schools, the accumulation of experiences is usually documented in Carnegie Units of credit. A quantitative measure of career readiness could include the total number of credits a student acquired, which might be organized by individual subjects and separated by the categories of academic and technical. Increasingly, schools and some states have innovated by using competency lists to define student learning. When using a competency profile, the

<table>
<thead>
<tr>
<th>Sample Industry Certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accredited Business Accountant</td>
</tr>
<tr>
<td>Adobe Certified Expert -- Adobe InDesign</td>
</tr>
<tr>
<td>ASE Auto Maintenance and Light Repair</td>
</tr>
<tr>
<td>Broadband Premises Installer (BPI)</td>
</tr>
<tr>
<td>Certified Apprentice Drafter -- Architectural</td>
</tr>
<tr>
<td>Certified Veterinary Assistant (CVA)</td>
</tr>
<tr>
<td>CompTIA A+ Certification</td>
</tr>
<tr>
<td>FAA Airframe Mechanic</td>
</tr>
<tr>
<td>HVAC Excellence Employment Ready-Air Conditioning</td>
</tr>
<tr>
<td>National ProStart Certificate of Achievement</td>
</tr>
<tr>
<td>NCCER Carpentry --- Level 1</td>
</tr>
<tr>
<td>Pre-Apprenticeship Certificate Training (PACT)</td>
</tr>
<tr>
<td>RECF Robotics Certification</td>
</tr>
<tr>
<td>Registered Clinical Massage Therapist (RCMT)</td>
</tr>
</tbody>
</table>
quantitative data can also be used to show competencies that have not been met. However, most high schools remain committed to the century-old Carnegie Unit.

An extension of determining the total number of credits a student has earned could be the number of dual credits earned in the form of college credit hours. These indicate the number of experiences that students had in secondary school that met the equivalent standards for postsecondary education. Among the ways this can occur are through courses offered by a university at a high school, articulation agreements that translate high school experiences into equivalent college-credit hours, and Advanced Placement courses.

**Qualitative Data**
Several types of qualitative data are important for measuring career readiness. One is a work portfolio. The best example of a work portfolio is in the arts, where it is natural for students to demonstrate their proficiency in an art form by displaying or performing examples of their work. This is often referred to as a portfolio. In other performance-skill areas, students would place either the actual objects or representations of those objects in their portfolios. A portfolio may include the best work that students feel that they have completed to be evaluated directly by a prospective employer or may include an expert ratings on work that indicates qualitatively the best work that they had completed.

Another form of qualitative data is an employability profile. This document identifies the specific technical and employability skills that students are expected to acquire and are often rated using some type of scale, measured either by the teacher and/or supervising employer. It may also cover some of the personal skills and work habits that students should possess.

**Sample Student Profile**
The following is an example of what an overall data picture might look like for a particular student regarding career readiness.
### SAMPLE CAREER READINESS PROFILE

**Student:** Angelique Rivera

#### Academic

<table>
<thead>
<tr>
<th>Credit Earned</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT WorkKeys</td>
<td>Level 5 of 6</td>
</tr>
<tr>
<td>ACT Test</td>
<td>27 of 36</td>
</tr>
<tr>
<td>NYS Regents --- English Language Arts</td>
<td>82 of 100</td>
</tr>
<tr>
<td>NYS Regents --- Algebra I</td>
<td>77 of 100</td>
</tr>
<tr>
<td>NYS Regents --- Global History &amp; Geography</td>
<td>88 of 100</td>
</tr>
<tr>
<td>NYS Regents --- Earth Science</td>
<td>91 of 100</td>
</tr>
</tbody>
</table>

#### Performance

| NOCTI Visual Communication   | 96 of 100 |
| ACE- Photoshop Certificate   | Yes |
| College Credits --- Graphic Design | 6 hours |
| Graphic Portfolio            | Rated Exemplary |

#### Personal

| Rexford Character Traits     | Rated Exemplary |
| Graphic Arts Employability Profile | Yes |
| 6 Week Internship            | Yes |
| 50 Hours Service Learning    | Yes |

### Schoolwide Career Readiness Data

The four types of data — ratings, binary, quantitative, and qualitative — provide a robust picture of individual student achievement, but it sometimes becomes confusing to try to aggregate this data on a schoolwide basis. The best way to represent overall school achievement is to indicate the percentage of students who complete school and reach various targets for student achievement. Avoid averaging student rating scores, because it often results in misleading statistics. Rather, select a target rating level and indicate the percentage of students who have met that level. In the case where state or national assessments are used, a target threshold on the test could be identified. For example, a school may indicate that 80% of their students met an ACT benchmark of 24. In the case of quantitative data such as number of high school or college credits earned, the school can set a benchmark of the desirable level of credits and indicate the percentage of students who met that benchmark. For example, the
school might to set earning nine college credits while still in high school as an ideal level of achievement. In the case of binary data, whether students have or have not earned a specific industry/career credential is easy to indicate. Qualitative data is the most difficult to aggregate. But, just as teachers use rubrics to evaluate the quality of student performances, a rubric can also be used to rate the quality of an employability profile or a career plan. An example of data in this regard might be indicating that 80% of students have met a level of proficiency in their employability profile.

A school profile on career readiness, with the categories a school decides upon to represent this level of achievement might look like the following example.

<table>
<thead>
<tr>
<th>SAMPLE SCHOOL PROFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rexford High School</td>
</tr>
<tr>
<td><strong>Academic</strong></td>
</tr>
<tr>
<td>Graduates with 28 or more credits</td>
</tr>
<tr>
<td>Graduates with at least 9 hours of college credit</td>
</tr>
<tr>
<td>Graduates with at least level 4 on Workkeys</td>
</tr>
<tr>
<td>Graduates with at least 24 on ACT</td>
</tr>
<tr>
<td>Graduates with at least 75 in English language arts exam</td>
</tr>
<tr>
<td>Graduates with at least 80 in Algebra I exam</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
</tr>
<tr>
<td>Graduates with at least one industry work certificate</td>
</tr>
<tr>
<td>Graduates completing 6 credits of career and technical education</td>
</tr>
<tr>
<td><strong>Personal</strong></td>
</tr>
<tr>
<td>Graduates rated exemplary</td>
</tr>
<tr>
<td>Graduates with employability profile</td>
</tr>
<tr>
<td>Graduates completing 6-week internship</td>
</tr>
<tr>
<td>Graduates completing at least 50 hours service learning</td>
</tr>
</tbody>
</table>
A Scenario
Ariella Chapman, a new assistant principal in the high school, was excited about the opportunity to provide leadership to the entire school community. She was given responsibility for the two career academies: Graphic Design and Construction. She was familiar with many of the career academy teachers and the courses in the academies. The career academy objectives were to provide opportunities for students to learn technical skills, as well as related academics that would give them sound educational preparation along with career skills.

Ariella believed the career academies were successful because she had observed high levels of student engagement. Shortly after assuming her new responsibilities, the principal asked Ariella to collect data that would help the school evaluate the effectiveness of the academies, which had only been in place for three years. She thought about using “satisfaction surveys,” but she decided that the most important measure of success was student achievement, so she turned to student data.

Ariella designed a simple research study of the academic achievement of the students who had completed three years in the career academies. With the assistance of the data resource person in the district, she identified two groups of students: one that had completed the career pathway and a matching group of students that had not participated in the academies. She was able to pair-up students by similar test scores and grade-point averages based upon 8th grade student data. She then compared the achievement of the pairs on the state assessments in English and math and was very pleased to discover that more than 3/4 of the students in the career academies had higher academic achievement than their matched pair. She was able to say confidently that the majority of students were succeeding academically while participating in the academies.

Although this initial data analysis resulted in a positive conversation with the principal, Ariella wanted to see if she could dig deeper into the data to document the success of the academies. If these academies were truly successful, the school wanted to expand the number of academies to include more students across the high school. After reviewing research and best practices in other schools, she created a data profile for students in the career academies that would result in a more comprehensive picture of student achievement.

This broader documentation provided valuable information to the students as they reflected on their high school experience. It also enabled Ariella to showcase the success of the career academies for the
rest of the high school staff and district personnel. Students were not only succeeding in academic skills; they were also earning credits toward postsecondary education, accumulating industry certificates, and graduating with a meaningful employability profile and an education plan for pursuing additional learning and work toward their career goals.

References


This appendix contains operational definitions of key terms presented and discussed throughout the handbook. The intent is not to provide “textbook” definitions, but rather to present practical definitions that contextualize the terms for educators.

**Achievement test** — a standardized test used to measure how much students have learned in clearly defined content areas.

**Acting stage (of action research)** — the stage of action research characterized by implementing an action research study through data collection and analysis.

**Action research** — systematic and scientific classroom- or school-based research conducted by individuals who have a vested interest in seeking improvements in that particular setting; the focus of this professional activity is the pursuit of improvements to teaching and students’ academic achievement.

**Analytic rubric** — a scoring rubric that enables the teacher to score separate parts of the product or performance first, then sum up the individual scores to obtain a total score on the entire assessment.

**Assessment** — any measure of student learning and academic progress; this includes classroom assessments, both formative and summative, and standardized assessments.

**BETTER Learning Model** — a series of teacher reflection surveys built around six instructional elements that reflect essential 21st-century skills and research on effective teaching; the six elements are: Build connections with relevance, Engage as independent learners, Test for proficiency, Target personal skills and work habits, Empower with hope and confidence, and Reward creativity and innovation.

**Binary score (as a type of student data)** — a “true/false” or “yes/no” score indicating whether or not a student has had a particular experience; minimum and maximum scores are defined by the scale.

**Career interest surveys** — surveys that ask students numerous questions related to specific skills that they enjoy performing and/or personal qualities that they would use to describe themselves; the resulting score assists students in identifying possible career areas or paths that might be appropriate based on the nature of their responses across the entire instrument.

**Classroom assessments** — any type of assessment, other than standardized assessments, that is locally-developed and is administered to students in the classroom setting; these might include chapter tests, unit tests, research papers, group projects, presentations, daily homework, etc.

**Criterion** — a pre-established standard or benchmark for academic performance.
**Criterion-referenced score** — a test score that compares a student’s performance to some pre-established criteria or standards.

**Data-driven decision making** — a process by which educators examine the results of standardized tests and other assessment data in order to identify student strengths and deficiencies; the ultimate goal is a critical examination of curriculum and instructional practices relative to students’ actual performance on standardized tests and other forms of assessments.

**Data Focus** — refers to the degree of specificity of data and whether it can be used to take action effectively based upon that data. Disaggregating overall scores into sub-scores is one way to increase data focus.

**Data Relevancy** — refers to the appropriateness of the data to the purpose; for example, data on teacher satisfaction with a professional development workshop has less relevancy for measuring actual learning compared to a follow-up observation to determine if teachers actually use the new skills introduced.

**Data Source** — refers to where the data originates; for example, student perceptions and teacher observations are multiple sources of data on teaching effectiveness.

**Demographics** (see **Student demographics**)

**Developing stage (of action research)** — the stage of action research characterized by the development of an action plan for implementation and future cycles of action research.

**Employability Profile** — a list of skills and knowledge (technical, academic, and personal) related to a career area, with ratings of student proficiency; it is intended to communicate to potential employers the student’s competencies as a result of completing an education program.

**Formative assessments** — assessments administered typically during instruction to provide immediate and informal feedback to students and teacher; examples include homework, quizzes, exit tickets, teacher questions, informal observations, diagnostic assessments, etc.

**Foundation learning** — the content and skills that a district or school requires all students to master.

**Group (or class) report** — a test report that summarizes student performance across an entire class, course, or other defined group.

**Holistic rubric** — a scoring rubric that requires the teacher to assign a single overall score to the performance or product.

**Individualized intervention strategies** — strategies implemented for individual students who are struggling academically; typically these strategies are developed as a result of analyzing assessment data for the student.

**Instructional revisions for large groups** — strategies implemented to target general deficiencies observed for a large number of students, such as a class or an entire course; these strategies are typically developed as a result of analyzing assessment data for the whole group.
Interest surveys — strategies and/or instruments that help teachers get to know their students better for purposes of gearing instruction toward things that interest the students.

Item analysis — a formal or informal examination of test performance; on an informal level, this analysis consists of reviewing how students performed on each item on a classroom test.

Learner engagement — the degree to which students demonstrate behaviors and attitudes that reflect interest in their own learning—and willingness to take responsibility for it.

Learning style — an individual’s natural or habitual way of acquiring and processing information; the two categories of learning styles are sensory mode and thinking mode.

Lexile — a measure of reading ability and text difficulty that is used to match readers with appropriately leveled reading material.

Mini-rubric — an easy-to-use variation of a performance assessment rubric; it is essentially a combination of a checklist and one analytic criterion.

Multiple intelligences — any of nine innate traits that an individual possesses and uses to acquire new knowledge and skills, according to Howard Gardner.

Multiple measures — a concept related to data-driven decision making that stresses the importance of having adequate samples and types of evidence in order to make decisions about students’ academic progress; essentially, the more diverse data collected, the more accurate the resulting decisions will be.

Norm group — the sample of students (usually a national sample) that serves as the basis of comparison for scores obtained by a local group of students on a norm-referenced standardized test.

Norm-referenced score — a test score that compares individual student scores to the performance of other similar students.

Percentile rank — a single score resulting from a standardized assessment that indicates the percentage of the norm group that scored below a given raw score.

Perceptions — quantification of the opinions of staff, students, parents, and other stakeholders in education regarding program effectiveness and student achievement; typically collected through the administration of surveys.

Performance assessments — assessments that require hands-on tasks or some other form of performance-oriented activity or demonstration of the ability to “do,” such as an extended writing activity, a presentation, the execution of specific performance tasks, or a group project; performance assessments are scored using specifically defined and pre-established criteria.

Performance task — one of two components (along with a scoring rubric) of a performance assessment; the task is the actual prompt or activity supplied to students as part of a performance assessment; it specifies exactly what they are to do.
**Personal skill development** — the enhancement of characteristics that prepare students for lifelong learning and success in life and career.

**Planning stage (of action research)** — the stage of action research characterized by developing a plan for the action research study.

**Professional reflection** — as applied to educators, engagement in a process of examining one’s own instructional practice critically in order to systematically and scientifically improve that practice.

**Projections** — expert predictions of future data based on current data adjusted by the rate of change and other factors

**Quality score (as a type of student data)** — data, either numerical or narrative, that contains a certain degree of subjective, non-quantifiable judgment.

**Quantity score (as a type of student data)** — data that measure the amount of some characteristic or experiences that students have had; theoretically, there is no maximum value.

**Raw score** — the number of items answered correctly by a student on each subsection of a standardized assessment.

**Rating (as a type of student data)** — designation of student performance on a fixed scale.

**Reflecting stage (of action research)** — the stage of action research characterized by reflecting on the action research process.

**Scoring rubric** — one of two components (along with a performance task) of a performance assessment; the scoring rubric, or guide is essentially a rating scale consisting of specific pre-established performance criteria used to evaluate student work on performance assessments; rubrics may be either **holistic** or **analytic**.

**Sensory mode** — one of two categories, along with thinking mode, of learning styles; sensory mode styles (i.e., visual, auditory, tactile, and kinesthetic learning) are based on preferences that students have for using the senses they are most comfortable with in order to acquire new knowledge.

**Standardized test** — an assessment that is administered, scored, and interpreted in a standard, consistent manner; any test that is given in the same manner to all test takers is a standardized test.

**Stanine** — a type of norm-referenced score that provides the location of a raw score in a specific segment of the normal distribution; these scores range from 1 to 9, where 5 is the average score.

**Stretch learning** — learning that is characterized by students having and taking opportunities for rigorous and relevant learning beyond the minimum requirements identified in foundation learning.

**Student assessment data** — virtually any sort of data that can be collected and used to aid in making decisions about students.
**Student demographics** — the various combination of student characteristics that make up the school population; the demographic information typically includes sex, race, age, socio-economic status, etc.

**Summative assessments** — assessments whose results are typically used for administrative-type decisions; these assessments are typically administered following large units of instruction; examples include unit tests, chapter tests, end-of-course exams, final exams, placement tests, state assessments, etc.

**Teacher self-reflection** — a process whereby teachers critically evaluate the quality, effectiveness, and adequacy of their instructional performance.

**Test report** — a wide variety of data reports resulting from the administration of a standardized test; these include, but are not limited to, individual student reports and district, school, class, or group reports.

**Thinking mode** — one of two categories, along with sensory mode, of learning styles; thinking mode styles (i.e., concrete-sequential, abstract-sequential, concrete-random, and abstract-random learning) are based on a student’s preferred approach to thinking and acquiring new knowledge.

**Triangulation** — closely related to the concept of multiple measures, this process involves not only using multiple measures, but also interpreting the results of those measures in comparison to each other in order to make decisions about students that are more valid than single measures.

**Value-added method (VAM)** — a set of statistical procedures that compare actual student achievement scores to predicted scores; results may be used as a factor in teacher evaluations.

**WE™ Survey Suite** — easy-to-use instruments that ask students, staff, and community members to share their perceptions anonymously about the learning environment, quality of instruction, and leadership in any school or district; the suite includes WE Learn™, WE Teach™, WE Lead™, WE Support™, and WE Are Ready surveys.