Authentic Assessment Tools

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Skillful and effective teachers require students to analyze and synthesize information, apply what they have learned, and demonstrate their understanding of material according to specified criteria. They have developed learning and assessment experiences to engage students and teach them how to "produce," rather than simply "reproduce" knowledge (Burke 1992, p. 5). In these classrooms, the emphasis shifts from facts and isolated knowledge to active learning, where students work together to examine information and issues, solve problems, and communicate ideas. These shifts in emphasis are often accompanied by changes in assessment practices typified by involving students in authentic tasks, measuring a variety of outcomes, and involving students in self-assessment and reflection.

The focus of this chapter is on the "tools" used to conduct authentic assessment. It is important to preface this discussion by thinking about some key contextual issues. As anyone who has ever worked with tools of any kind knows, tools can be (and often are) misused. They are often used in ways and for purposes other than those for which they were designed. To press the analogy still further, most "tool boxes" contain a diverse selection of tools, each of which are selected and used for various purposes. Appropriate tool selection and use is a function of the knowledge and skill of the "tool user." Much the same is true of authentic assessment. The toolbox is full of tools; but we must first think carefully about the various contexts and purposes for which they are used.

Connecting, Reflecting, and Feedback

There are three important aspects or concepts that should accompany any type of authentic assessment: connecting, reflecting, and feedback.

Connecting

Across the nation, considerable attention is being directed toward the reform of testing and assessment. Much of this thrust is designed to extend assessment beyond testing, with its emphasis on facts and fragments of information, to authentic methods of assessment. A key feature of many of these authentic strategies is that students are required to connect facts, concepts, and principles together in unique ways to solve problems or produce products. Cognitive research has challenged the belief that learning and learning transfer occur simply by accumulating and storing bits of information (Shepard 1989, p. 4). Contemporary learning theory holds that learners gain understanding as they draw on and extend previously learned knowledge, construct new knowledge, and develop their own cognitive maps (connecting diagrams) interconnecting facts,

concepts, and principles. Research indicates that information learned and assessed as a linear set of facts fails to yield the kinds of in-depth understanding needed to function in our modern society.

Glaser (1988) describes a number of different types of evidence collected through assessment. One of the most important of these is "coherence of knowledge." Glaser goes on to observe that beginners' knowledge is spotty and superficial, but as learning progresses, understanding becomes integrated and structured. Thus assessment should tap the connectedness of concepts and the student's ability to access interrelated chunks.

Authentic assessments are almost always framed in the form of learning experiences. These experiences are typically sequenced from simple to complex and are progressive in nature. An important role of teacher-facilitators is to help students connect the knowledge and skills learned in previous tasks and then extend them to related or more complex tasks. Transfer of knowledge and skills is enhanced when students recognize the connectedness of learning. A number of authentic assessments such as graphic organizers, writing samples, and portfolios require students to connect (or synthesize) what they have learned to produce finished products. Many technical tasks presented in technology-based programs require students to connect their previous knowledge of mathematics, science, social studies, and English to solve problems and complete tasks and projects.

Reflecting

The range of available options for teachers wishing to improve student assessment extends beyond the cognitive and psychomotor domains to include assessment of attitudes and other affective behaviors. The key element here is to help students develop their self-awareness and reflective skills. Students need to learn how to assess their own work and to think about their thinking. A key aspect of many forms of authentic assessment is the opportunities that are provided for students to reflect on their thinking, practices, and learning. The technical term for this type of reflective process is metacognition.

Robin Fogarty (1994), in her excellent book ***The Mindful School: How to Teach for Metacognitive Reflection***, defines metacognition as a sense of awareness— "knowing what you know and what you don't know" (p. viii). Barell (1992) extends Fogarty's definition to include feelings, attitudes, and dispositions because thinking involves not only cognitive operations but also the dispositions to engage in cognitive activities.

Burke (1994) notes that metacognitive reflections provide students with opportunities to manage and assess their own thinking strategies. "Metacognition involves the monitoring and control of attitudes, such as students' beliefs about themselves, the value of persistence, the nature of work, and their personal responsibilities in accomplishing a goal" (p. 96). These attitudes are fundamental to all tasks in varying degrees, whether academic or nonacademic. Teachers need to provide opportunities for students to engage in the kind of metacognitive moni-

toring where they reflect on "what we did well, what we would do differently next time, and whether or not we need help" (p. 96).

Numerous researchers (Barell 1992 Fogarty, Perkins, and Barell 1992; and Perkins and Salomon 1992) have explored the critical relationship between metacognition and learning transfer. Barell (1992) states that "in order to transfer knowledge of skills from one situation to another, we must be aware of them; metacognitive strategies are designed to help students become more aware" (p. 259). Fogarty, Perkins, and Barell (1992) define transfer as "learning something in one context and applying it in another" (p. ix).

In the constructivist view of learning, individuals absorb information and make sense of that information through metacognitive reflection. Reflection allows individuals to recognize the gaps that exist in their understanding. As gaps are recognized and become significant to students, they are motivated to locate, apply, and connect previous learning as well as to construct new knowledge.

Burke (1994) and Fogarty (1994), in their works on metacognition, detail a number of metacognitive strategies that can be used by classroom teachers. These include such techniques as Mrs. Potter's Questions, KWL charts, PMI charts, transfer journals, wrap-around, reflection page, learning logs, seesaw thinking, pie in the face, stem sentences and many others.

- Mrs. Potter's questions: What were you expected to do in this assignment? What did you do well? If you had to do this task over, what would you do differently? What help do you need from me?

- The KWL strategy consists of a three-column chart in which one column (K) is devoted to what I **Know**, the second (W) to what I **Want** to know, and the third (L) to what I **Learned** after finishing this lesson or assignment.

- The PMI strategy is similar to the KWL chart except the first column (P) is devoted to the **Plus** or favorable things found about a learning experience, the second (M) focuses on the **Minuses** or unfavorable finding, and the third (I) is devoted to what the student found **Interesting** about the learning experience.

Descriptions of other metacognitive strategies can be found in Burke's and Fogarty's books. It is very important to provide opportunity for learners to reflect on what has been learned as teachers rush to "cover the content in the textbook" and prepare learners to "pass the test." Many learners are unaware of their thinking processes while they are learning and trying to create personal meaning out of some learning experience. When asked to describe what they initially thought about a topic, how they began to create personal understanding about some content, and what they would be able to do with this new knowledge or skill, they can't describe how they went about it and usually reply "I don't' know how I did it, I just did." Students who are taught how to reflect on learning by using metacognitive reflection strategies should be able to monitor, assess, and improve their own thinking and learning performance.

Feedback

Another important outcome of authentic assessment has to do with providing feedback to learners related to significant objectives. Wiggins (1993) notes that many teachers erroneously believe they are providing feedback with test scores and coded comments such as "good work," "vague," and "awkward." What is wanted and needed by learners is user-friendly information about performance and how improvement can be made. Learners need information that will help them self-assess and self-correct so that assessment becomes integrated throughout the learning experience.

Wiggins (1993) draws a subtle, but important, distinction between guidance and feedback. Guidance gives direction whereas feedback tells one whether or not they are on course. Guidance is typically teacher initiated and tends to be prescriptive. By contrast, feedback actively involves and engages the learner. Frequently, the process is collaborative and reflective; the teacher and student become partners in the learning process. Figuratively, feedback techniques are those experiences that help students see themselves and their performance more clearly. Throughout the assessment process, students are provided with real-time information about the quality of their performance.

Wiggins (1993) notes that feedback is more like a running commentary rather than measurement. It enables learners to monitor their performance, thinking about whether or not they are on the right track without labeling or censoring their performance. From this feedback perspective, the emphasis shifts from "measurement" as an end goal to "assessment" as an ongoing and continuous process. To maximize the effect, feedback should occur while the performance is underway, not just after it is evaluated.

Mastery of complex, integrative learning activities extends well beyond simply responding to probing questions following performance. Rather, it involves continuous feedback throughout the process of solving complex problems. Successful performance requires concurrent feedback inherent in the task itself or in the context in which the task is performed that enables learners to self-assess and self-correct as accurately as possible. Optimally, feedback is best when it becomes an integral part of students' own mental processes, when they learn how to assess themselves. Similar to other real-life situations, feedback is comprised of a complex set of external (family members, friends, co-workers, and supervisors) and internal messages (reflective and metacognitive thinking).

Self-Assessment

One of the more exciting, but underused, dimensions of authentic assessment is student self-assessment. Students want to know how they are doing *while* they are performing some tasks and, even more, they want to know how well they did when the task is completed. In traditional assessment, students must wait until post-performance tests have been graded for feedback. In alternative assessment

classrooms, students are encouraged to engage in self-assessment and to collaborate with teachers to review performance and decide the next steps in the learning process.

One of the key aspects of student self-assessment has to do with criteria (or standards). These criteria come in different forms. In "self-referenced" assessment, learners evaluate performance in light of their own goals, desires, and previous attainments and thus become more cognizant of present performance as well as steps that must be taken to extend their learning. In this type of self-assessment, standards are embedded in the value system and inherent goals of students. In "standards-referenced" self-assessment, learners compare their own characteristics of performance against established standards or criteria.

Self-assessment abilities represent a critical workplace skill. In the workplace, individuals are continuously faced with situations in which they must assess situations, make decisions, and then evaluate the quality of those decisions. This type of authentic, formal self-assessment activity is rare in most public schools and universities. In most schools, students rarely have the opportunity to evaluate their own performance, because teachers have assumed the assessment role. Teachers who bemoan student apathy, lack of personal investment in their own education, willingness to settle for minimal performance, and even cheating may not realize that they are experiencing the results of teacher-vested assessment. What if students could be genuinely empowered to engage in meaningful self-assessment? What if the locus of authority in the assessment process were to be shifted from teacher to student, where the authority is shared? What if students had a real voice in developing and assessing their own learning?

At this point, it is important to acknowledge that this vision of self-assessment is contingent on such things as students' developmental level, maturity, and previous educational experiences. Self-assessment techniques are not uniformly appropriate and will not always work. However, students who are given the opportunity to become more engaged in the learning process and in assessing their own progress often do respond with intelligence, responsibility, and determination after a learning period in which they develop assessment skills (Mabry 1999). For example, D'Urso (1996) reports the results of a study of second-grade students involved in their own assessment. She concludes that students' sense of self improved, their work became more meaningful to them, they became protective of the knowledge they had gained, and they began to reflect on what they knew as well as on what they still needed to discover. They discovered their own "voice" and developed a deeper sense of self.

Strategies and Tools

We now turn our attention to the tools themselves. These tools must be carefully selected to provide opportunities for students to practice and perform meaningful tasks that are reflective of life outside of the classroom. Authentic assessment starts with the selection of meaningful learning tasks. These tasks need to be organized and structured so that they are contextualized, integrative,

metacognitive (require students to think about thinking), related to the curriculum taught, flexible (require multiple applications of knowledge and skills), open to self-assessment and peer assessment, contain specified standards and criteria, and are ongoing and formative (Weber 1999).

Mabry (1999) notes that we must match purpose or outcome expectations with assessment strategies. "What do we want to assess–and do we really need to assess it?" "Why do we want to assess it–what will we do with the results?" "How should we assess–how can we get the information we need?" "How can we assess without harmful side effects?" (p. 41). The central issue here has to do with "tool selection." Given a particular problem, situation, or set of questions, teachers need to learn to ask, "What is the best tool for the job?"

Teachers will need to use a variety of assessment tools and techniques in order to enable all students to have a more complete picture of their growth and achievement. The National Center for Research in Vocational Education study *Using Alternative Assessment in Vocational Education* (Stecher et al. 1997) identified four categories of alternative assessment that are widely used in vocational education: (1) written assessments, including selected response types such as multiple choice and constructed responses types such as essay items or writing samples; (2) performance tasks; (3) senior projects including research papers, performance projects, and oral presentations; and (4) portfolios. With the development of computer-based simulation software, additional possibilities are being developed.

A wide variety of assessment tools are available to teachers and students. As one reviews the list of tools, it will become immediately obvious that there is scant distinction to be made between performance activities and assessment techniques. A key feature of authentic assessment is a "blurring" of the distinctions typically drawn between classroom activities and assessment (see Figure 1).

The kinds of performance activities shown in Figure 1 can serve as a basis for developing authentic assessments to transform assessment practices from summative and teacher directed to formative and student centered. A detailed discussion of each of these performance activities and how to structure assessment components is beyond the scope of this work. However, it is useful to make some general observations about the usefulness of these techniques as well as ideas for implementation. Following the general overviews, three performance activities (learning logs and journals, portfolios, and projects) are discussed in more detail. There is a growing body of well-illustrated resources available that are designed to help teachers structure authentic assessments. One particularly useful resource for authentic assessment tools is Skylight Professional Development < www.skylightedu.com > .

Graphic Organizers and Concept Mapping

- Concept maps
- Data tables
- Cause and effect diagrams
- Graphs
- Run control charts
- Flowcharts
- Pareto diagrams

- Correlation/scatter diagrams
- Idea webs/graphic organizers
- Geographic maps
- Time lines
- Venn diagrams

- Event chains
- Histograms
- PMI strategy reports
- Mrs. Potter's questions
- Connecting elephants
- Big idea generation
- Ranking ladders
- Mind maps

Performance Products

- Business letters
- Autobiographies
- Editorials
- Displays
- Drawings/illustrations
- Experiments
- Essays
- Surveys
- Storyboard reports
- Job applications
- Book reviews
- Bulletins
- Critiques
- Crossword puzzles
- Designs
- Requisitions

- Vitas/Resumes
- Inventions
- Lab reports
- Information-seeking letters
- Management plans
- Math problems
- Geometry problems
- Models
- Writing samples
- Job searches
- Cartoons or comics
- Collages
- Consumer reports
- Handbooks
- Booklets
- Home projects

- Pamphlets
- Observation reports
- Research reports
- Posters
- Workplace scrapbooks
- Grant applications
- Team reports
- Career plans
- Video yearbooks
- Training plans
- Exhibits
- Ballads
- Announcements
- Biographies
- Questionnaires
- Technical repairs

Live Performances and Presentations

- Interviews
- Issues/controversy
- Workplace skits
- Slide shows/video
- Human graphs
- Announcements

- Games/quiz bowls
- Student-led conferences
- Story time/anecdotes
- Prepared and extemporaneous speeches

- Commercials
- Demonstrations
- Newscasts
- Plays-TV/radio broadcasts

Figure 1. *Authentic assessment tools/performance activities*

Graphic Organizers and Concept Mapping

Graphic organizers are visual representations of mental maps using important skills such as sequencing, comparing, contrasting, and classifying. They involve students in active thinking about relationships and associations and help students make their thinking visible. Many students have trouble connecting or relating new information to prior knowledge because they cannot remember things. Graphic organizers help them remember because they make abstract ideas more visible and concrete. This is particularly true for visual learners who need graphic organizers to help them organize information and remember key concepts (Burke 1994).

Teachers can help students use graphic organizers by modeling and using topics that can be easily understood. Students can develop skills in developing graphic organizers if they are allowed to work first in small groups and can select a topic of their choice related to the lesson content.

Although graphic organizers are learning tools, they can also effectively be used as authentic assessment tools. Teachers who involve students with graphic organizers need to develop exemplary models that can be used for assessment. Criteria describing what content and relationships should be visually shown in student work need to be developed and used in rubric (scoring) form to make assessments more objective. Similar to essay questions, which require written expression in a connected manner, graphic organizers require students to present information in written and visual format. Graphic organizers also can be used as a test item format to assess student learning. This provides students with a creative and engaging way of expressing what they know and are able to do.

Performance Products

Many of the performance activities are end products of learning that can be assessed by rubrics (scoring forms) and other assessment tools designed to measure both processes and product quality.

Teachers who use authentic performance products provide students with opportunities to construct knowledge in real-world contexts so they can understand what they have learned. These products serve as a culminating experience in which students can retrieve previous learning, organize important information, and complete an assigned activity showing mastery of what they have learned.

Some teachers are reluctant to assign performance products because they do not feel comfortable grading them. They recognize that it takes time to construct exemplary models and to develop criteria and performance indicators required for rubric development. The key to assessing performance products is to set the standards and criteria in advance. Students who know the criteria that will be used to assess their work receive valuable instructional guidance in completing their products so they meet and/or exceed expectations.

As teachers recognize the importance of engaging students in making performance products, they will learn how to structure the learning environment to facilitate the process. They will also plan ahead to develop the tools needed to assess both the process of developing the product as well as the completed product. Scoring rubrics are one of the key assessment tools used for performance products. Information on how to construct and use them follows later.

Live Performances and Presentations

As with performance products, the key to effective assessment of live performances and presentations is establishing the criteria and performance indicators in advance. Criteria and performance indicators effectively organized into scoring

rubrics provide examples of what students must do to demonstrate that they have learned at a specified level. The most important assessment strategy with live performances and presentations is to engage students in assessing their own performance first, followed by teacher assessment and an opportunity for students and teachers to interact over assessment findings. Live presentations involve two major assessment factors. One is the quality of the assigned work and the second is the demonstration of presentation skills. Scoring rubrics must include both of these factors.

Rubrics

Among the most common methods for student self-assessment are scoring rubrics. Marzano, Pickering, and McTighe (1993) have defined rubrics as "a fixed scale and list of characteristics describing performance for each of the points on the scale" (p. 10). Rubrics are scoring devices (or tools) that are designed to clarify, communicate, and assess performance. They are grading tools containing specific information about what is expected of students based on criteria that are often complex and subjective.

Rubrics typically contain two important features; they identify and clarify specific performance expectations and criteria, and they specify the various levels of student performance. In their simplest form, rubrics are checklists requiring a "yes" or "no" response. More complex rubrics include written standards of expected student performance with different levels of performance indicators describing student performance that meets or exceeds the standard.

There are as many different types of rubrics as there are rubric designers. Most rubrics fall under the two categories, holistic or analytical. Holistic rubrics consider performance as a totality, with the primary purpose being to obtain a global view of performance, typically on complex tasks or major projects. By contrast, analytical rubrics are designed to focus on more specific aspects of performance. Their purpose is to provide specific feedback on the level of performance on each major part, with the advantage of providing a detailed analysis of behavior or performance. These rubrics detect strengths and weaknesses and identify areas for refinement.

Rubrics of both types can be used appropriately for product and process assessment as well as for formative and summative assessment. It is also important to note that rubrics are typically developed and used as open communication devices. For example, it is not unusual for students to be involved in the process of developing the rubrics that will be used to assess their performance. Used in this way, rubrics become an effective mechanism for clarifying and openly communicating the expectations of learning activities. Many teachers share and discuss the contents of rubrics that will be used to assess an activity early in the process. As a result, the expectations are clarified and, in some cases, negotiated.

There are numerous advantages to using rubrics provide for both students and teachers:

- Enabling assessment to be more objective and consistent,
- Focusing attention of the assessor on the important outcomes with an assigned value for each,
- Demystifying the expectations for the student by assigning values for each expected outcome,
- Allowing students to identify strengths and to focus on weak areas while providing opportunity to revisit them,
- Prompting teachers to identify critical behaviors required for task completion and to establish the criteria for performance in specific terms,
- Encouraging students to develop a consciousness about the criteria they are to demonstrate in their performance as well as the criteria they can use to assess their own abilities and performance,
- Promoting an emphasis on formative as well as summative evaluation,
- Providing benchmarks against which to measure and document progress,
- Lowering student anxiety about what is expected of them,
- Ensuring that students' work is judged by the same standard, and
- Leading students toward high-quality performance.

There are some disadvantages as well. Rubrics can be time consuming to develop and use. Good rubrics also must be grounded in clearly identified and stated criteria or standards. In many cases, these have not yet been identified or developed. Once the criteria have been clarified, considerable work remains to clearly identify the key indicators that will be used to assess the various levels of attainment for each of the criteria. This is the hard work of solid, clear, and meaningful assessment. The expectations must be clarified and then the level of attainment must be described and clearly communicated.

Some general guidelines for involving students in constructing and using rubrics have been developed by Goodrich (1997):

1. Begin by looking at models. Show students examples of good and not so good work. Identify the characteristics that make the models good and the bad ones bad.

2. List the critical criteria for the performance. A good guide is to think about what you would need to include if you had to give feedback to a student who did poorly on a task. Students can be involved in discussing the models to begin a listing of what counts in high-quality work.

3. Articulate gradations of quality or determine the quality continuum. Describe the best and worst levels of quality, and then fill in the middle based on knowledge of common problems associated with the performance. Use descriptive terms such as Not yet, OK, and Awesome instead of failure, average, and excellent.

4. Engage students in using the rubrics created to evaluate the models given them in step 1 as practice in self-assessment and to pilot test the rubrics.

5. Give students their task. As they work, stop them occasionally for self- and peer assessment using the rubrics provided.

6. Give students time to revise their work based on the feedback they received in step 5.

7. Use the same rubric students used to assess their work. This is made possible by including a scoring column for students, peers, and teachers.

8. Schedule a debriefing time with students to compare their rubric scoring with those completed by the teacher. Require students to reflect on the next steps in the learning process.

One excellent resource is **Assessing Student Outcomes: Performance Assessment Using the Dimensions of Learning Model** by Marzano, Pickering, and McTighe (1993), published by the Association for Supervision and Curriculum Development. This work contains many examples of rubrics for specific tasks and situations. Another approach to developing rubrics using a "shell" to cluster criteria according to valued workplace competencies (e.g., creative thinking, contributing citizen, problem solving, effective communication, etc.) was developed by Custer (1996).

Portfolios

Another alternative assessment tool that has attracted widespread popular attention is portfolios. Portfolios are collections of student work gathered over time. The contents of portfolios can range from comprehensive coverage containing a plethora of materials to those that are quite selective, containing only a limited number of student-selected items. Student portfolios offer a range of flexibility that makes the method attractive to a wide range of teachers and programs. The elements to be included in this type of assessment are almost endless. Several critical components of effective portfolios are—

•   A thoughtful student-developed introduction to the portfolio,
•   Reflection papers behind each major assignment of the portfolio,
•   Scoring rubrics for portfolio entries that enable students to self-assess their work,
•   Established models, standards, and criteria that enable students to select their best work to be included in the portfolio, and
•   Student oral presentation of their portfolios to significant others such as peers, teachers, and parents.

Portfolio assessment offers many advantages, but Frazier and Paulson (1992) note that the primary value of portfolios is that they allow student the opportunity to evaluate their own work. Further, portfolio assessment offers students a way to take charge of their learning; it also encourages ownership, pride, and high self-esteem. Portfolios can be maintained over several years and can be used as "pass-

ports" as students move from one level of education to another. Portfolio passports can also be used as valuable tools for obtaining jobs in business and industry.

Portfolio assessment requires careful thought and preparation on the part of both teachers and students. Vavrus (1990) offers the following considerations and recommendations that should be considered in designing a portfolio assessment system.

- ***What will it look like?*** Portfolios must have both a physical structure (binder as well as the arrangement of documents within the portfolio) and a conceptual structure (underlying goals for student learning).

- ***What goes in?*** To answer this question, other questions must first be addressed: Who is the intended audience for the portfolios? What will this audience want to know about student learning? How will these audiences be involved in portfolio development? Will selected documents of the portfolio show aspects of student learning that traditional test results do not show? What kinds of evidence will best show student progress toward expected learning outcomes? Will the portfolio contain best works only, a progressive record of student growth, or both? Will the portfolio include more than finished pieces–for example, notes, ideas, sketches, drafts, and revisions?

- ***How will procedural and logistical issues be addressed?*** How will student working files and portfolios be kept secure? When will students select documents to include in their portfolios? When will some portfolio document be taken out to specialize the portfolio? What criteria or assistance will be provided to students so that they can reflect on their work, monitor their own progress, and select pieces for inclusion in the portfolio? Will students be required to provide a rationale or explanation for work selected for inclusion in the portfolio?

- ***How will portfolios be evaluated and who will be involved?*** It is critical that students be actively involved in assessing their own work. To facilitate student self-assessment teachers will have to answer some important questions. What factors will be evaluated such as achievement in relation to standards, student growth along a continuum, or both? What models, standards, criteria and instruments will have to be developed to guide assessment? When will portfolio entries be evaluated? Will other teachers be involved assessing portfolio elements? Will parents or guardians be involved in assessing the portfolio? If so, how?

- ***What will happen to the portfolio at the end of the semester or school year?*** Will they be turned over to students at the end of the course or school year to keep and use as they see fit? Will students be encouraged to keep their portfolios over an extended period of time and use them as "passports" for entry into other levels of education or to work?

It is clear that portfolios are a way of collecting and packaging a comprehensive body of rich evaluation materials. The key is to think carefully through the many logistical, conceptual, and procedural issues that must be addressed in order for this tool to be used effectively. Portfolios should not be "a place to dump anything and everything" loosely related to a given course. Rather, their value as an assessment tool is maximized when they contain items that have been carefully and thoughtfully selected to address specified learning goals. At their best, portfolios can represent an extremely rich portrait of student ability and interest.

Learning Logs and Journals

Learning logs and journals are tools designed to cause students to reflect on what they have learned or are learning. Used properly, they encourage student self-assessment and provide a mechanism for making connections across the various subject matter areas. Journals have been used widely in English classes for many years. Now they are being adopted by other teachers to develop communication skills and to help students to make connections, examine complex ideas, and think about ways to apply what they have learned over an extended period of time. Herman, Aschbacher, and Winters (1992) indicated that the fundamental purpose of learning logs and journals is to "allow students to communicate directly with the teacher regarding individual progress, particular concerns, and reflections on the learning process" (p. 2).

A distinction can be made between learning logs and journals. Learning logs usually consist of short, objective entries under specific heading such as problem solving, observations, questions about content, lists of outside readings, homework assignments, or other categories designed to facilitate recordkeeping (Burke 1994). Student responses are typically brief, factual, and impersonal. Fogarty and Bellanca (1987) recommend teachers provide lead-ins or stem statements that encourage students responses that are analytical (breaking something down into its parts), synthetic (putting something together into a whole), and evaluative (forming judgment about the worth of something). Example log stems include the following: One thing I learned yesterday was…, One question I still have is…, One thing I found interesting was…, One application for this is…, and I need help with…

By contrast, journals typically include more extensive information and are usually written in narrative form. They are more subjective and focus more on feelings, reflections, opinions, and personal experiences. Journal entries are more descriptive, more spontaneous, and longer than logs. They are often used to respond to situations, describe events, reflect on personal experiences and feelings, connect what is being learned with past learning, and predict how what is being learned can be used in real life (Burke 1994). As with learning logs, stem statements can be used to help students target responses. Example lead-ins are as follows: My way of thinking about this is…, My initial observation is…, Upon reflection I…

Learning logs and journals can be used in the following ways (Burke 1994):

- Record key ideas from a lecture, video, presentation, field trip, or reading assignment,
- Make predictions about what will happen next in a story, video, experiment, event, situation, process, or lesson,
- Record questions and reflect on the information presented,
- Summarize main ideas of a lesson, article, paper, video, or speech,
- Connect the ideas presented to previous learning, or to other subjects or events in a person's life,
- Monitor change in an experiment or event over time,
- Brainstorm ideas about potential projects, papers, presentation, assignments, and problems,
- Help identify problems and record problem-solving techniques, or
- Track progress in solving problems, readings, homework assignments, projects, and experiences.

Learning logs and journals can be effective instructional tools to help students sharpen their thinking and communication skills. They give students the opportunity to interact with the teacher, lesson content, textbooks, and each other. They also afford students an opportunity to think about material, clarify confusion, discuss key ideas with others, connect with previous learning and experiences, and reflect on the personal meaning of subject matter. They provide a record over time of what has been presented and learned. Furthermore, logs and journals are typically best used to promote formative assessment, although they also can be structured to provide summative assessment information.

Projects

Many different types of projects can be developed to challenge students to *produce* something rather than *reproduce* knowledge on traditional tests. Projects allow students to demonstrate a variety of skills including communication, technical, interpersonal, organizational, problem-solving, and decision making skills (Burke 1994). Projects also provide students with opportunities to establish criteria for determining the quality of the planning and design processes, the construction process, and the quality of the completed project.

The Southern Regional Educational Board has published a guide to preparing a syllabus for its *High Schools that Work Program* that includes a major focus on projects as the centerpiece of curriculum, instruction, and evaluation. This guide, **Designing Challenging Vocational Courses** by Bottoms, Pucel, and Phillips (1997), describes the procedures required to select and sequence major course projects, develop project outlines, decide on an instructional delivery plan, and develop an assessment plan.

Several states, notably California and Kentucky, have made successful completion of a student-initiated culminating project (senior project) a part of their student assessment system. The California Department of Education (1994), in collabora-

tion with the Far West Laboratory, has developed the Career-Technical Assessment Program (C-TAP), which includes a C-TAP project. The project is a major piece of "hands-on" work designed and completed by each student. The project becomes an instructional and assessment tool that allows students to demonstrate skills and knowledge learned in a sequenced instructional program. Completing the project provides a mechanism for students to plan, organize, and create a product or event. Through this process, students are able to pursue their own interests, meet professionals in the field who can offer advice and instruction related to their project, work cooperatively with others in certain parts of the project, and apply the knowledge and skills they have learned in other school subjects. Each student's project must be related to the career-technical program in which they are enrolled and can take as little as a few weeks to complete or several months. Students are allowed to work on the project themselves or in small groups. There are four major sections of the C-TAP project:

1. *Plan:* A process that helps the student design the project
2. *Evidence of Progress:* Three pieces that show the student's progress toward developing the final product
3. *Final product:* A final product that is the result of the student's work
4. *Oral presentation:* An oral presentation in which the student describes the project, explains what skills were applied, and evaluates his or her work

C-TAP projects are evaluated in two ways with two separate scores being generated. First, the project is rated using a rubric focused on three evaluation dimensions: content, communication, and responsibility. Content pertains to career-technical knowledge and skills, communication relates to the overall presentation of work, and responsibility pertains to the student's ability to complete work independently. The second score (also generated using a rubric) focuses on oral presentation skills including public speaking skills, content knowledge, and analysis. A student manual and a teacher guidebook contains the information necessary for the complete operation of the C-TAP program.

Summary

Many factors are driving assessment reform in this country, including an emphasis on constructivism and authenticity, standards, and higher-order thinking skills. These forces and others have stirred interest in the educational community to look for alternatives to traditional testing in order to give a more accurate and complete picture of student growth and achievement. Organizations that specialize in assessment (e.g., the Far West Laboratory and the Center for Research on Evaluation, Standards, and Student Testing) are working with school systems to develop and test alternative assessments. The preliminary results are quite promising in terms of reform in curriculum and instructional practice as well as increased student engagement in the learning and assessment process. Assessment of learning is truly a "work in process." It is exciting to see the progress that has been made to move beyond teaching and testing fragmented lists of declarative knowledge in favor of involving students in applying knowledge in unique and authentic ways.

The challenge for teachers is to commit to change the way they teach and assess students as well as put forth the effort to develop and use alternative assessment strategies such as those described in this chapter. Every effort should be made to develop meaningful, authentic learning and assessment tasks that target the knowledge, skills, and attitudes necessary for learning and life. Educators must also learn how to organize and structure these tasks so that they are contextualized, integrative, flexible, and open to self-assessment and peer assessment. Additionally, a clear focus on standards and criteria must be maintained in a way that provides for both formative and summative procedures. Students should be encouraged to become actively involved in the assessment process through metacognitive reflection, establishing criteria and performance indicators required to develop effective scoring rubrics, and using these scoring instruments to assess their own work. Effective feedback is the key to improved student learning. Yet many teachers are reluctant to spend the time required to develop and exhibit exemplary models of expected performances and to teach students how to assess and regulate their own performance.

Considerable progress has been made in the 1990s in designing and implementing alternative assessments. There are many success stories that point toward systemic change in the way educators are structuring curriculum, delivering instruction, and assessing student growth and achievement. Much of this work closely mirrors work that has been done in vocational education for many years. The current shared interest between the vocational and academic communities holds promise for improving both as teachers share ideas, techniques, and tools across disciplines.

Authentic assessment supports change in curricula, teaching, and school organization. But the real question is "Do these new assessment methods and techniques contribute to improved student learning?" A growing number of teachers seem to think so. Reporting on the effects of authentic assessment in action at five schools, Darling-Hammond, Ancess, and Falk (1995) note that classroom interactions, student work, exhibitions, and hallway conversations provide widespread evidence of in-depth learning, intellectual habits of mind, high-quality products, and student responsiveness to rigorous standards.