The process of selecting or developing an assessment begins with an examination of the intended uses of the assessment results. The first section of this chapter explores the purposes of vocational assessment and classifies the case studies of alternative assessment systems by purpose. Then, because vocational assessments must take into account the characteristics of the students being educated and the nature of the content being presented, the second section explores recent changes in the context of vocational education and their implications for assessment.

PURPOSES

Educational assessments can serve a variety of purposes, and the choice of assessment depends in part on how the assessment information will be used. There are three broad uses for educational assessment, all of which are relevant to vocational education (U.S. Congress, Office of Technology Assessment, 1992):

- To improve learning and instruction
- To certify individual mastery
- To evaluate program success

Vocational teachers use the results of tests and other assessments to monitor the progress of students, diagnose their needs, and make instructional plans. When students complete courses or sequences of courses, vocational programs use assessments to certify that students have achieved a required level of mastery or have met industry
standards. Finally, aggregated information about student progress (acquired knowledge and skills, success in courses, etc.) is used to judge the quality of vocational programs. Although a single assessment may be used for many purposes—for example, standardized test results are used by teachers to identify individual student weaknesses and target instruction, and they are used by legislators and the general public to judge the quality of the state education system—it may not be equally effective for them all. Therefore, the choice of assessment should be made with the three possible broad uses of the information clearly in mind.

The most common reason for assessing students is to measure their individual progress as a means of improving instruction and promoting learning. Through direct observation and a variety of formal and informal assessment strategies, teachers keep track of what students learn, which instructional approaches work, and where changes need to be made. To be most helpful for these purposes, assessments should provide detailed information on the specific knowledge and skills that have been taught in the class. They should be administered often and graded quickly, and information should be provided to teachers and students so that adjustments can be made. Such assessments can be either on-demand or cumulative. Since teachers use the assessment results in conjunction with other knowledge of student performance, less of a premium needs to be placed on technical quality.

The demands change when assessments are used to verify that students have mastered a particular set of skills or body of knowledge. Assessment for mastery may focus on general abilities (such as for college admission) or specific skills (such as for professional licensing). The results are used for decisions about selection, placement, promotion, and certification. Because of the importance of these actions, extra attention must be paid to the quality of the measures, including their reliability, validity, and fairness. In many cases, mastery testing is based on multiple rather than single measures to increase the validity of the results.

Assessment can also be used to provide information about the quality of programs, schools, and districts that are providing education and training. This accountability may be based on individual performance or on group performance (e.g., a class or school). When
used to compare and reward programs, accountability assessments also should demonstrate a high degree of reliability and validity.

Our case studies demonstrate the full range of purposes, as shown in Table 1.

**Vocational Student Population**

The educational objectives and course-taking behaviors of vocational students at the secondary level differ from those of vocational

<table>
<thead>
<tr>
<th>Assessment Activity</th>
<th>Measuring Individual Learning for Instructional Improvement</th>
<th>Certifying Mastery</th>
<th>Holding Programs Accountable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career-Technical Assessment Program (C-TAP)</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky Instructional Results Information System (KIRIS)</td>
<td>✅</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>Laborers-AGC environmental training and certification programs</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>National Board for Professional Teaching Standards (NBPTS) certification program</td>
<td></td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Oklahoma competency-based testing program</td>
<td>✅</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>Vocational/Industrial Clubs of America (VICA) national competition</td>
<td>✅</td>
<td>✅</td>
<td></td>
</tr>
</tbody>
</table>
students at the postsecondary level. As a result, secondary and postsecondary vocational programs may have different priorities for assessment.

At the secondary level, there has been a decrease in vocational course-taking in favor of more academic coursework. One consequence of this change may be that secondary vocational educators look to assessment as a course improvement tool more than they have in the past. Compared with the situation in the 1980s, students are taking fewer vocational courses, there are fewer vocational teachers, and there are fewer university programs training these teachers (Boesel and McFarland, 1994). Between 1982 and 1992 academic course-taking was up by 22 percent and vocational course-taking was down by 17 percent (Vocational Education Journal, 1995). Even with this trend, in 1992 almost all public high school graduates (97 percent) completed at least one vocational education course (Levesque et al., 1995, p. 7). Twenty-four percent of high school students were considered vocational concentrators, completing at least three credits in a single vocational program area.

Although secondary vocational education is often associated with students planning to go to work after high school, most seniors plan to go on to some form of postsecondary education—49 percent plan to attend a four-year college or university and 22 percent plan to attend a two-year college or technical, vocational, or trade school. Only 15 percent of seniors plan to work full time (MPR Associates, 1996). Rather than taking coordinated sequences of courses in an occupational area, vocational students take single vocational courses to learn more about a career or to learn a specific skill related to work (i.e., word processing). Consequently, the emphasis in secondary vocational programs is more on assessments that are relevant to students taking only one or two courses—i.e., more on those that provide information to improve learning and instruction than on those for certifying mastery of employment skills.

The enrollment pattern of vocational students at the postsecondary level is quite different, and the assessment needs of postsecondary vocational educators are thus different as well. In the late 1980s, postsecondary vocational enrollment increased at the same pace as enrollment in general. Thirty-five percent of all undergraduate students were enrolled in postsecondary vocational education. In non-
baccalaureate programs, about one-half of these students reported majoring in a vocational area (Boesel and McFarland, 1994). Students in vocational courses vary in age, work experience, and career aspiration. More important, postsecondary vocational students have varying motives for enrolling in vocational education courses. Some students enroll in a course to advance their career or begin retraining for a new career. This creates a need for assessments that provide information on how to improve learning and instruction, as is the case at the secondary level. Other students enroll in a sequence of courses in order to enter a particular career or to be certified for a particular job. In this case, vocational educators need to be able to certify that students have mastered relevant skills. In addition, accountability requirements apply to students who complete sequences of vocational courses, and staff must have assessment data to evaluate the success of these programs.

Knowledge and Skills

Vocational education was created to prepare students for specific jobs, but many argue that this focus on narrow training should change (Lazerson and Grubb, 1974). In the early 1900s, there was strong support from the business community for the federal government to fund vocational education in order to alleviate the scarcity of “skilled” workers through “skill” education. Businessmen alleged that the rise of factories had made the existing apprenticeship system obsolete and that it was difficult and economically inefficient to rely on informal, on-the-job learning in modern factories (Lazerson and Grubb, 1974). Hence, in 1917 the Smith-Hughes Act granted federal funds to public schools to develop skill-oriented vocational education programs.

Since 1917, the U.S. economy and workplace have broadened and diversified, as have the goals for vocational education. The statement of purpose of the most current federal law, the 1990 Carl D. Perkins Vocational and Applied Technology Education Act (American Vocational Association, 1992), reads:

It is the purpose of this Act to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population. This purpose will principally be achieved through concentrating
resources on improving educational programs leading to academic and occupational skill competencies needed to work in a technologically advanced society.

Attitudes toward the teaching and learning of vocational skills have changed in two important ways. The first change has to do with the degree of specificity of work. Americans have learned to place greater value on broad skills that relate to a family or cluster of jobs than on narrow skills defined in terms of a single job. The second change relates to the “situatedness” of work. The understanding that skills do not exist in isolation but are defined by the way work is organized is taking hold. These two new points of view have implications for instruction and assessment in vocational education.

The first change concerns the specificity of job skills. Skills can be thought of as lying on a continuum between general workforce preparation and specific occupational skills. Table 2 provides an example of skills from the health occupations at four points on this continuum. At the most general level, workforce preparation consists of basic communication and computation, which may be offered within traditional academic disciplines or in broadly focused vocational courses. The second level comprises narrower, industry-

<table>
<thead>
<tr>
<th>General Workforce Preparation</th>
<th>Industry Core Skills and Knowledge</th>
<th>Occupational Cluster Skills</th>
<th>Specific Occupational Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Workers</td>
<td>Health Services</td>
<td>Health Information Services</td>
<td>Health Information Technology</td>
</tr>
<tr>
<td>Read, write, perform mathematical operations, listen, and speak</td>
<td>Be aware of the history of health</td>
<td>Locate information in medical records</td>
<td>Evaluate medical records for completeness and accuracy</td>
</tr>
<tr>
<td></td>
<td>Use health care terminology</td>
<td>Use computer programs to process client information</td>
<td>Use a computer program to assign patients to a diagnosis-related grouping</td>
</tr>
</tbody>
</table>
or occupation-specific skills intended to help individuals prepare for workforce entry. Occupational cluster and specific occupational skills describe progressively more focused sets of skills that a worker needs to master for a job within a group of related occupations or a specific occupational field.

Traditionally, vocational educators in the United States have focused on skills at the latter, narrow end of this continuum and have organized training programs around them. In this approach, occupational responsibilities are decomposed into distinct, separable components that become the basis for the curriculum. For example, the trade of welding might be broken down into fifty to 100 distinct skills that are taught and practiced one at a time. This model for analyzing the demands of an occupation (called the job competency model) predominates in occupational training, occupational certification and licensing, and in the military (Wirt, 1995). A detailed inventory of component skills serves as the basis for training and assessment. Instructors or supervisors “check off” one by one those tasks that a person can perform and indicate one by one at what skill level they can be performed. The Oklahoma Vo-Tech assessment system is based on detailed task analyses of this type.

In recent years, however, employers have begun to seek less job-specific training and more general-workforce preparation. This shift from specific to general training reflects changes in the workplace due to technological progress and international competition. Secondary and postsecondary vocational programs are responding by developing programs that teach both broad and specific skills and that integrate academic and vocational knowledge. Federal law (U.S. Congress, 1990) mandates greater integration of academic and vocational education and an emphasis on “all aspects of the industry,” so attention to the more generic skills is a growing priority for vocational education. Table 3 shows a breakdown of our sample of assessment systems based on the specificity of knowledge and skills addressed.

The type of knowledge and skills to be assessed can affect the choice of assessment methods, although there is no one-to-one correspondence between skill types and assessment types. Traditional assessment forms, including multiple-choice and short-answer questions, are efficient ways to measure factual knowledge and application of
skills related to printed material. For example, a student enrolled in a nursing course may need to learn terminology and record-keeping skills that can be assessed well with multiple-choice and short-answer tests. However, there are other skills (many from other parts of the continuum) for which such tests are less well suited. The same student may also need to be able to work as part of an integrated health care team, a skill not as well assessed with pencil-and-paper methods. As discussed in the next chapter, alternative assessments may be more effective at measuring some vocational skills, including work skills more broadly defined.

The second change in thinking about vocational skills concerns the importance of the work context (Stasz et al., 1996). Cognitive scientists have begun to look at what people actually do in the workplace.
(especially in “high performance” work environments) and have determined that the knowledge of experts in a particular field is often highly integrated and situational. Instead of viewing jobs as a list of decontextualized skills or abilities, researchers are beginning to describe the actions of workers as performances in response to situations (Wirt, 1995). In addition, experts gain and use information by working with others and creating shared knowledge to be used in the workplace. For example, although a dental technician and a vocational nurse both need to communicate with other health care professionals in their jobs, the nature of their communication differs because the structure of their work teams differs. Furthermore, as frontline workers become more autonomous and are given greater responsibility for decision making, they play a greater role in shaping the nature of the work they perform (Berryman and Bailey, 1992). Employers are seeking individuals who can adapt to changing workplace conditions, communicate and work effectively with others, and solve problems. These are not skills that can be learned from a book or in pieces in a classroom; they require opportunities to perform in realistic settings.

This perspective on skills demands a different approach to instruction and assessment. Large units of performance become the focal point, and the units are “situated” in a realistic context such as might be encountered on the job. For example, students competing in a VICA contest typically are not asked to list the steps to be performed when taking an order from a client; instead they are asked to hold a realistic conversation with a person acting as client and are judged on how well they perform. Similarly, the work samples that students include in their C-TAP portfolios document performance of an occupational task in a real-world setting. Vocational assessments are becoming more highly situated, and most of the assessments we sampled emphasized authentic performance of complex behaviors in real-world settings.