

Ronald Anthony Milon

School of Education

Capella University

November 2004

In this era of greater accountability, assessment has taken on great urgency within all levels of education. Adult education, because of its marginal status within traditional educational institutions, is vulnerable. The very complexity of the adult's life makes measurement and assessment a difficult task. Compare three to four methods for assessing student achievement in higher educational institutions. Evaluate the appropriateness and effectiveness of each method and propose improvements or modifications. Include a discussion of concepts and applications of alternative assessments that will take into account the uniqueness of the adult learner.

Introduction

The 1980s and 1990s witnessed a wave of interest in assessment in higher education. In many states, publicly supported institutions of higher education have developed assessment programs in response to mandates from coordinating boards. All the regional accrediting associations articulated expectations for assessment and attention to assessment, and they have also moved beyond publicly supported institutions into the private sector. Today diversity in the student population, new delivery methods, new nontraditional institutions all are current trends in higher education; and with these trends come an increased concern for accountability of learning outcomes. New methods of delivery along with new or more directed curriculum are being questioned by educators, accrediting agencies, and by state educational departments. But since these institutions associate assessment with outcome accountability they often lose sight of the true meaning of assessment

Without effective assessment, it is impossible for educators and learners to appreciate the process and outcomes in education. The significance of assessment extends beyond the role of measured learning. Adult education, because of its marginal status within traditional educational institutions, is vulnerable to criticism regarding assessment.

The very complexity of the adult's life makes measurement and assessment a challenging task. Given this reality we must look at assessment differently. Assessment is more than how one shines at one moment; it is a critical part of how one learns and grows. It is about understanding a process between the facilitator and the learner. This essay will look at assessment in the traditional approach and compare it with methods now use in higher education. The review of assessment methods will be evaluated for its appropriateness and effectiveness as applied to the adult learner. It will be argued that assessment is a critical part of the learning process for both the teacher-facilitator and learner, and second, the assessment method selected depends on the process, goals and objectives, and often by politics within the learning institution. Finally, discussion regarding concepts and applications of alternative assessments taking into account the uniqueness of the adult learner will be provided to suggest further dialogue of its importance in relation to adult learning.

Definitions

Authentic assessment: Simply testing an isolated skill or a retained fact does not effectively measure a student's capabilities. To accurately evaluate what a person has learned, an assessment method must examine his or her collective abilities. This is what is meant by authentic assessment, which presents students with real-world challenges that require them to apply their relevant skills and knowledge.

Classroom assessment techniques (CAT): The basic idea of CAT is that the more you know about what and how students are learning; the better you can plan learning activities to structure your teaching.

Curriculum-based assessment is the ongoing assessment of a learner's predetermined set of behaviors in developmental areas (i.e. social, cognitive, communication, motor and adaptive). These forms are intervention models that link assessment, intervention and evaluation.

Performance-based assessment (PBA) is an assessment activity that requires students to construct a response, create a product, or perform a demonstration. PBA generally do not yield a single correct answer or solution but allow for a wider range of responses. Thus, evaluations of student responses, products, and performances are based on judgments guided by criteria.

Problem-based learning is a curriculum development and delivery system that recognizes the need to develop problem-solving skills as well as the necessity of helping learners to acquire necessary knowledge and skills.

Assessment and its purpose

Classroom assessment is a teaching approach and a set of techniques. The idea is based on the notion that the more you know about what and how students are learning; the better you can plan learning activities to structure your teaching. The techniques are mostly simple, non-graded, anonymous, in-class activities that give both the facilitator and the learner useful feedback on the teaching-learning process. According to Banta and Associates (1996):

“[t]he assessment of student learning begins with educational values. Assessment is not an end in itself but a vehicle for educational improvement. Its effective practice, then, begins with and enacts a vision of the kinds of learning we most value for students and strive to help achieve. Educational values should drive not only what we choose to assess but also how we do so. Where questions about educational mission and values are skipped over, assessment threatens to be an exercise in measuring what’s easy, rather than a process of improving what we really care about” (p. 3).

Angelo and Cross (1993) believes that classroom assessment is an approach designed to help teachers find out what students are learning in the classroom and how well they are learning it. Angelo further explains that,

“[c]lassroom assessment is a simple method faculty can use to collect feedback, early and often, on how well their students are learning what they are being taught. The purpose of classroom assessment is to provide faculty and students with information and insights needed to improve teaching effectiveness and learning quality. College instructors use feedback gleaned through Classroom Assessment to inform adjustments in their teaching. Faculty also share feedback with students, using it to help them improve their learning strategies and study habits in order to become more independent, successful learners.... Classroom Assessment is one method of inquiry within the framework of classroom research, a broader approach to improving teaching and learning” (Angelo, 1991, p. 29; http://www.texascollaborative.org/assessment_module.htm#bloomtax).

Davis (1993) continues along that idea by stating that classroom assessment is both a teaching approach and a set of techniques. Davis continues to say that classroom assessment differs from standardized testing in that it is aimed at course improvement, rather than at assigning grades (Davis, 1993). The primary goal is to better understand your students' learning and so to improve your teaching. McCarthy (2000) looks at assessment as part of the cycle of learning. McCarthy's model provides for understanding the core elements of learning, and provides guidance in how to use these elements to improve learning effectiveness. Assessment in this model is the reflecting mode of the learning process consisting of discussion method, information method, coaching method and self-discovery method (McCarthy, 2000). The 4 MAT system looks at assessment as an ongoing process and not something final as associated with traditional means of assessment.

Schilling & Schilling (1998) suggests that eight major shifts have occurred in the broad frameworks that have informed assessment practice:

- 1) Focus on the development of talent rather than simply displaying resources;
- 2) A move away from assuring minimal competency;
- 3) Broadening the focus beyond linear, goal-centered approaches;
- 4) Highlighting epistemological differences among the disciplines;
- 5) Redirecting the focus to students and their learning processes;
- 6) Making direct ties to teaching practice;
- 7) Thinking of improvement as a continuing agenda; and

- 8) Attending to the politics underlying judgments of effectiveness.

Each of these shifts has shaped assessment practice by making the process more congenial to faculty interests and dispositions. However, assessments tend to be designed for more specific purposes and goals. Those used in most states are designed to rank-order schools and students for the purposes of accountability. But assessments designed for ranking are generally not good instruments for helping teachers improve their instruction or modify their approach to individual students. These assessments are normally completed when classroom activities are over, and normally when the results are available they lack the level of detail needed to target specific improvements (Barton, 2002). Assessment involves much more than simply measuring the results of classroom interaction. It must take into account a multiplicity of stakeholders and an understanding of the kinds of learning that occur (Rose & Leahy, 1997, p. 1).

Assessment and stakeholders

Educational leaders

Some educators and especially stakeholders coming from political background use the terms of assessment, testing, and evaluation interchangeably as if they were the same. Assessment is a broad term referring to the process of gathering and synthesizing information to better understand and characteristics of the learners and learning process. Testing is one type of assessment. Tests generally utilize a paper-and-pencil format, are administered and taken within established time limits, restrict test testers' access to resources such as reference materials, and yield a limited range of acceptable response.

Evaluation involves making a judgment regarding quality, value, or worth, based on set criteria. When political stakeholders (political leaders and educational administrators) create policy based on performance they often make the mistake of creating such policy without understanding the differences of the three concepts or in understanding what is behind the data. Assessment is appealing to policymakers for several reasons: it is relatively inexpensive compared to making program changes, it can be externally mandated, it can be implemented rapidly, and it offers visible results. Evaluation utilizes many of the same methodologies used in traditional social research, but because evaluation takes place within a political and organizational context it cannot assist educators and learners in a positive and ongoing way.

A comprehensive definition is one that assesses not just the outcome(s) as in outcome based learning but also the process of learning. Finally, it takes into account the characteristics of the learner. This is critical in understanding how to assess adult learning.

The teacher (facilitator)

Faculty roles are different at each institution. At some institutions research is required for faculty members to move up in rank and there is a degree of prestige associated with research over teaching. In community colleges and many nontraditional colleges continued employment is based on student retention and successful classroom teaching. The concerns with assessment are affecting the educational institutions and faculty professional roles more than ever. In order for faculty to fully appreciate the importance of assessment in the learning process they must unlearn what they have

learned. First, administrators must view educators as adult learners and professional development must be grounded in the principles and practices of adult learning and adult education (Cranton, 1996). For faculty to truly appreciate the dynamics of adult learners they must comprehend is "ongoing" and "life-long" and like their students they too are "life-long" learners.

Faculty development must consist of ongoing training on understanding the learner, how to create a learning community, and how assessment is not a final product but an ongoing process. Six conditions are necessary if faculty members are to view assessment as an integral part of their role as adult educators:

- 1) Assessment must be embedded in a fiscal and policy context that supports innovation under administrative leadership providing vision and support.
- 2) Assessment must be grounded in the learning process.
- 3) Assessment must rely on evidence and forms of judgment that disciplinary specialists find credible.
- 4) Assessment must be rooted in a language and metaphors appropriate to both the faculty and the learner.
- 5) Assessment must be identified as a stimulus to reflective practice.
- 6) Assessment must accommodate the nature of faculty life in the academy in a way that stresses ongoing feedback and improvement.

Up until now little has been done to discuss and develop professional development on assessment that goes beyond setting monitoring retention and graduation rates. Faculty training is required if they are to understand assessment and learning and the characteristics of the adult learner. Authentic assessments do pose certain challenges.

They require abandoning traditional notions about testing and evaluation and they change teacher and student roles. They are time consuming for teachers to prepare and implement, because they require clarity in goals, outcomes, criteria, and expectations and assurance that all stakeholders understand (Hayes, 1994). To ensure that evaluation standards are applied consistently, teachers and other raters need careful training (Borthwick, 1995). Students need to be prepared for self-monitoring and reflection (Jones, 1994). Some may be more comfortable with the traditional boundaries of grades and testing at set times.

Adult Learners

Adults possess characteristics that influence how they learn and that should be considered when developing instructional programs. Although it is important to realize that each adult is an individual, some generalizations can be applied in working with adult learners. Knowles identified the following characteristics of adult learners:

First, adults are autonomous and need to be free to direct themselves. Their teachers must actively involve them in the learning process and serve as facilitators for them. Specifically, they must get participants' perspectives about what topics to cover and let them work on projects that reflect their interests. They should allow the participants to assume responsibility for presentations and group leadership. They should guide participants to their own knowledge rather than supplying them with facts. Finally, they must show participants how the class will help them reach their goals.

Second, adults have accumulated life experiences and knowledge that may include work-related activities, family responsibilities, and previous education. They need to connect learning to this experience base. To help them do so, they should draw

out participants' experience and knowledge that is relevant to the topic. They must relate theories and concepts to the participants and recognize the value of experience in learning.

Third, adults are goal-oriented. They, therefore, appreciate an educational program that is organized and has clearly defined elements (Knowles, Holton & Swanson, 1998). Instructors must show participants how this class will help them attain their goals. This classification of goals and course objectives must be done early in the course.

Fourth, adults are relevancy-oriented. Learning has to be applicable to their work or other responsibilities to be of value to them (Merriam & Caffarella, 1999). Therefore, instructors must identify objectives for adult participants before the course begins. This means, also, that theories and concepts must be related to a setting familiar to participants. Letting participants choose projects that reflect their own interests can fulfill this need.

Fifth, adults are practical, focusing on the aspects of a lesson most useful to them in their work (Merriam & Caffarella, 1999). They may not be interested in knowledge for its own sake. Instructors must tell participants explicitly how the lesson will be useful to them on the job.

As do all learners, adults need to be shown respect. Instructors must acknowledge the wealth of experiences that adult participants bring to the classroom. These adults should be treated as equals in experience and knowledge and allowed to voice their opinions freely in class.

Information about the amount and type of direction learners require can be obtained through a needs assessment. Adult learner involvement in needs assessment initiates a partnership with the instructor. Through needs assessment, adults can identify their problem areas in relation to the course topics, which are frequently a starting point for their learning (Cranton, 1989). Vella (1994) suggests looking at the needs assessment process as the WWW question: Who needs what as defined by whom, in which who is the learners, what are their needs, and who are the definers. The key question is "How do we listen to adult learners before we design a course for them, so that their themes are heard and respected?" (Vella, 1994, p. 5). Before designing a means of assessment educators must understand some critical characteristics of classroom assessment and how they relate to the adult learner.

Traditional assessment and the need for change

The primary purpose of classroom assessment is to inform teaching and improve learning, not to sort and select students or to justify a grade. Kasworm and Marienau (1997) "current institutional assessment programs are typically based on the characteristics of young adult learners and tend to assume linear, continuous participation oriented to a residential academic learning community" (p. 6). Assessments tend to be derivations of those that faculty members have applied to younger students, and reiterations of those they themselves experienced as students. Traditional assessment of learning often holds the following characteristics and accomplishes the following goals:

- Requires students to develop responses rather than select from predetermined options
- Elicits higher order thinking in addition to basic skills
- Directly evaluates holistic projects
- Synthesizes with classroom instruction
- Uses samples of student work (portfolios) collected over an extended time period
- Stems from clear criteria made known to students
- Allows for the possibility of multiple human judgments
- Relates more closely to classroom learning

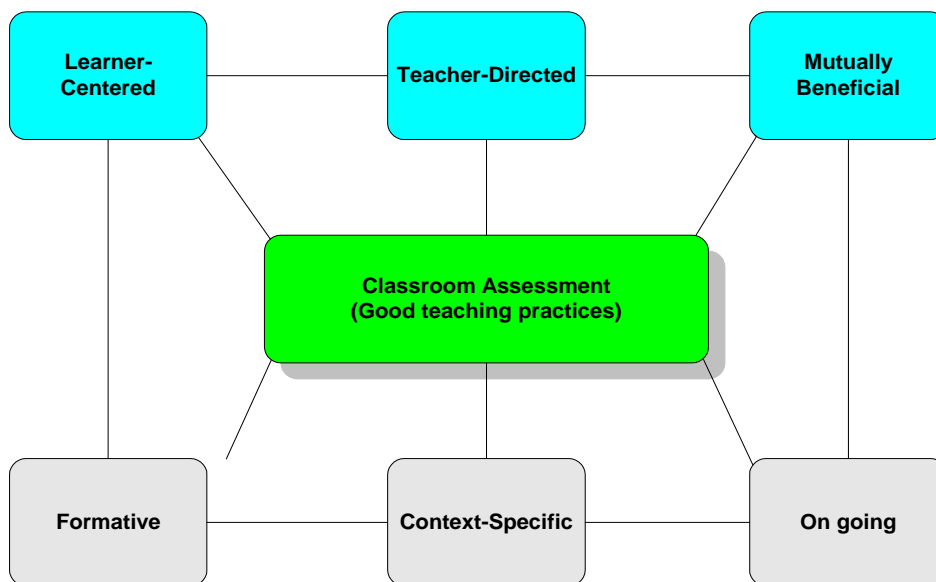
Assessment usually conjures up images of an end-of-unit test, a state-level examination on basic skills, or the letter grade for a final laboratory report. Standardized tests are considered high-stakes tests if their results are used for consequential decisions such as promotion, graduation, admission, certification, evaluation, or where rewards and sanctions are involved. For example, a district-wide minimum competency exam would be high stakes for students if passing the exam is a requirement for a high school diploma. Because they are intended to provide accountability information, one-shot large-scale standardized tests typically do not provide sufficiently detailed or timely information regarding student knowledge or achievement. Further, these aspects of assessment do not capture the full extent of how assessment operates in an adult learning environment.

Characteristics of classroom assessment

In order to see how assessment fits into the learning process it is important to look at the other components in learning-assessment model. The model, in figure 1, is based six ideas:

- Learner-centered
- Teacher-directed
- Mutually beneficial
- Formative
- Context-Specific
- Ongoing

Figure 1: Characteristics of classroom assessment



(Angelo & Cross, 1993; graphic designed using MS Visio)

Learner-centered: We need to engage learners with their own goals and a willingness to construct new knowledge. Learning is a basic human function; however, it is very difficult to teach something to someone who does not want to learn. Unfortunately, many of the students in our schools have made "not learning" their primary work. Without student interest, learning proceeds at a very slow pace, if at all. When teachers are the learners in workshops or institutes, these contexts need to be learner-centered as well. Learner-centered implies that the learner is actively engaged in the process of knowledge construction. Learning is an active, exciting process that can be difficult, frustrating, and challenging but is not inherently boring. Boredom sets in when learning is reduced to repetitive actions or assignments that are disconnected from larger goals or contexts. Skill development requires some amount of practice but practice is motivated by performance. The player who shoots baskets or blocks shots in practice has visions of how these skills will play out in the next game. The game provides the attitude and motivation to practice hard.

Teacher-directed: Classroom Assessment respects the autonomy, academic freedom, and professional judgment of college faculty. The individual teacher decides what to assess, how to assess, and how to respond to the information gained through the assessment. Also, the teacher is not obliged to share the result of Classroom Assessment with anyone outside the classroom.

Mutually beneficial: Because it is focused on learning, Classroom Assessment requires the active participation of students. By cooperating in assessment, students reinforce their grasp of the course content and strengthen their own skills at self-assessment. Their motivation is increased when they realize that faculty are interested

and invested in their success as learners. Faculty members also sharpen their teaching focus by continually asking themselves three questions: "What are the essential skills and knowledge I am trying to teach?" "How can I find out whether students are learning them?" "How can I help students learn better?" As teachers work closely with students to answer these questions, they improve their teaching skills and gain new insights.

Formative: Classroom Assessment's purpose is to improve the quality of student learning, not to provide evidence for evaluating or grading students. The assessments are almost never graded and are almost always anonymous.

Context specific: Classroom Assessments have to respond to the particular needs and characteristics of the teachers, students, and disciplines to which they are applied.

Ongoing: Classroom Assessment is an ongoing process, best thought of as the creating and maintenance of a classroom "feedback loop" (Angelo & Cross, 1992, p. 51). By using a number of simple Classroom Assessment Techniques that are quick and easy to use, teachers get feedback from students on their learning. Faculty then complete the loop by providing students with feedback based on the results of the assessment and suggestions for improving learning. To check on the usefulness of their suggestions, faculty members use classroom assessment again, continuing the "feedback loop." As the approach becomes integrated into everyday classroom activities, the communications loop connecting faculty and students—and teaching and learning—becomes more efficient and more effective.

Rooted in good teaching practice: Classroom Assessment is an attempt to build on existing good practice by making feedback on students' learning more systematic, more flexible, and more effective. Teachers already ask questions, react to students' questions,

monitor body language and facial expressions, read homework and tests, and so on. Classroom Assessment provides a way to integrate assessment systematically and seamlessly into the traditional classroom teaching and learning process. This model is a direct argument against the traditional methods used for assessment and one that takes into account the characteristics of the adult learner.

Even when college teachers routinely gather potentially useful information on student learning through questions, quizzes, homework, and exams, it is often collected too late—at least from the students' perspective—to affect their learning. In practice, it is very difficult to de-program students who are used to thinking of anything they have been tested and graded on as being over and done with. Consequently, the most effective times to assess and provide feedback are before the chapter tests or the midterm or final examinations. Classroom assessment aims at providing that early feedback.

Principles in assessing adult learning

Although many adult learning activities do not require formal evaluation procedures, adult learners need to learn how to identify and evaluate their own resources, abilities, and knowledge realistically. When formal evaluation is required, "[e]valuation strategies for adults are most effective when traditional authority roles are de-emphasized, and the learner's role as an autonomous, responsible adult is emphasized" (Kopp, 1987, p. 50). Adults should be involved not only in determining what they learn but also in identifying and establishing their own evaluation techniques. Kopp suggests the following three collaborative approaches that can be used in establishing a basis for evaluation: 1) Group decision making in which class members participate jointly in

identifying and selecting evaluation strategies to be used; 2) Learning contracts that help learners clarify their objectives, document their learning and evaluation plans, and commit themselves to the work they have contracted to do; and 3) Grading contracts that provide learners with options in the relative weight of evaluation activities and in the amount of work they will perform (Kopp, 1987). Involving adults in evaluating their own learning activities helps them become more independent and self-directed in their learning endeavors.

In designing an assessment model for adult learners the following principles need to be considered (Kasworm & Marienau, 1997).

- Learning is derived from multiple sources.
- Learning engages the whole person and contributes to that person's development.
- Learning and the capacity for self-direction are promoted by feedback.
- Learning occurs in context; its significance relates in part to its impact on those contexts.
- Learning from experiences is a unique meaning-making event that creates diversity among adult learners.

Learning comes from multiple sources not just the textbook and not just in a traditional classroom. The term non-formal education has been used to describe learning opportunities outside formal educational settings that complement or supplement the needs of underserved adults or learners in developing nations (Merriam & Caffarella, 1999). Typically according to Merriam and Brockett (1997), "the non-formal adult

learning opportunity is less structured, more flexible and more responsive to localize needs (Merriam and Brockett inside Merriam & Caffarella, 1999, p. 29).

The second characteristic—learning engages the whole person and contributes to that person’s development—is a popular idea in adult theory especially in transformative learning. Transformative learning is basically the kind of learning we do as we make meaning of our lives. It has become a very popular topic in adult education because it doesn't just involve classroom learning—it involves learning about our lives. This is important because as adults, the meaning making process can change everything about how we look at work, family, and the world.

Mezirow (1991) came up with a set of phases that people go through when they experience transformation and those steps are:

- Experiencing a disorienting dilemma
- Self-examination
- Critical assessment of assumptions
- Recognizing that others have gone through a similar process
- Exploring options
- Formulating a plan of action
- Reintegration

Transformation is something that is usually triggered by a problem, and very often transformative experiences are painful to go through. After identifying their problem or challenge, people seem to enter a phase where they reflect critically on this—this is typically a problem that you have never experienced before, so it takes a lot of thinking and talking to others to work through. During the thinking phase, people may

find that they can no longer keep their old ways of thinking and being—they are compelled to change. Finally, there is an action phase where people decide to do something. This could mean that you have to break off certain relationships that don't fit your beliefs anymore; it could mean that you decide to make a career change—action can take many forms. Also, the process itself may take a long time. You could reflect on something for years before you are ready to accept new beliefs and act on them. So clearly, transformative learning is not "little" learning, and this is one of the problems that people have with this whole theory. For example, what if you go back to school and get a degree—have you transformed yourself? This is a tough question and the answer won't be the same for everybody. What Mezirow says is that learning "can consist of a change in one of our beliefs or attitudes" (Merriam & Caffarella, 1999, p. 320); this is what he calls a "meaning scheme."

Since learning is an individual process, the instructor cannot do it for the student. The student can learn only from personal experiences; therefore, learning and knowledge cannot exist apart from a person. A person's knowledge is a result of experience, and no two people have had identical experiences. Even when observing the same event, two people react differently; they learn different things from it, according to the manner in which the situation affects their individual needs. Previous experience conditions a person to respond to some things and to ignore others.

All learning is by experience, but learning takes place in different forms and in varying degrees of richness and depth. For instance, some experiences involve the whole person while others may be based only on hearing and memory. Aviation instructors are faced with the problem of providing learning experiences that are meaningful, varied, and

appropriate. As an example, students can learn to say a list of words through repeated drill, or they can learn to recite certain principles of flight by rote. However, they can make them meaningful only if they understand them well enough to apply them correctly to real situations. If an experience challenges the students, requires involvement with feelings, thoughts, memory of past experiences, and physical activity, it is more effective than a learning experience in which all the students have to do is commit something to memory.

These characteristics offer insight on possible teaching strategies for adult learning as shown in table 1. Teaching strategies are critical in developing effective assessment approaches. This idea fits the equation of learning and the adult learner since assessment is an essential component of the learning process.

Table 1: Adult learner characteristics and teaching strategies

Adult Learner Characteristics	Teaching Strategies
<p>Adults have years of experience and a wealth of knowledge</p>	<p>Use your adult students as resources for yourself and for other students; use open-ended questions to draw out students' knowledge and experiences; provide many opportunities for dialogue among students</p>
<p>Adults have established values, beliefs, and opinions</p>	<p>Take time to clarify student expectations of the course; permit debate and the challenge of ideas; be careful to protect minority opinions within the class</p>
<p>Adults expect to be treated as adults</p>	<p>Treat questions and comments with respect; acknowledge contributions students make to the class; do not expect students to necessarily agree with your plan for the course</p>

Adults need to feel self-directed	Engage students in designing the learning process; expect students to want more than one medium for learning and to want control over the learning pace and start/stop times
Adults often have a problem-centered approach to learning	Show immediately how new knowledge or skills can be applied to current problems or situations; use participatory techniques such as case studies and problem-solving groups
Adults tend to be less interested in survey types of courses and more interested in straightforward how-to	Focus on theories and concepts within the context of their applications to relevant problems; orient the course content toward direct applications rather than toward theory
Adults have increased variation in learning styles (individual differences among people increase with age)	Use a variety of teaching materials and methods to take into account differences in style, time, types, and pace of learning

Some Characteristics of learners, with teaching implications
<http://www.rit.edu/~609www/ch/faculty/learner.htm>

Methods of assessment

Traditionally, assessment methods in adult educational programs have used standardized, norm-referenced achievement tests. Alternatives to the standardized tests include competency-based assessment, performance based assessment, problem-based assessment, assessment in a collaborative environment, and assessment of critical thinking.

Standardized Tests

Standardized tests are popular because they offer certain advantages: (1) their construct validity and scoring reliability have been tested; (2) they are cost-effective and don't require a great deal of training to administer; (3) funding sources accept them as part of the documentation of program accountability; (4) they allow for comparisons of learner progress across programs; and (5) they give learners a sense of where they stand compared to students in other programs (Brindley, 1989).

In spite of these apparent advantages, standardized tests have a number of disadvantages.

- Standardized tests fail to distinguish between language, literacy, and culture. In other words, they don't tell us whether a learner has trouble with an item because (1) he or she is unfamiliar with the cultural notion underlying the task; (2) lacks the requisite knowledge of English vocabulary or sentence structure; or (3) does not have enough experience with reading and writing to complete the task.
- Reduce the complexity of language and literacy learning to a set of skills
- Standardized tests do not reflect what has been taught or capture all the learning that has taken place
- Standardized tests do not capture changes in language use and literacy practices beyond the classroom and don't provide data on the sociolinguistic and affective dimensions of language and literacy.
- Standardized tests do not discriminate well at the lower end of literacy achievement, failing to capture experience with environmental print or

provide information on the different levels of "initial literacy," such as being able to write the names of one's children but not those of strangers.

- Standardized tests focus on pencil and paper tasks, the very things that literacy students have trouble with.
- Standardized tests do not provide opportunities for literacy students to show what they can do in "real-life."

Most people assume that analysis of a test can be done only after the fact, when student performance data have been generated. To make this assumption according to McMillan is to “neglect what might be called the once-of-prevention principle, which suggests that devoting one hour to a colleague’s review of the exam is better than devoting five hours answering students challenges” (McMillian, 1988, p. 13). Better outcomes are determined by better teaching and use of assessment methods which reflect the skills being taught and process. The assessment methods that follow take these important concerns into account.

Competency-based assessment

Closely related to criterion-referenced standardized testing, competency-based learning (CBL) measures an individual’s performance against predetermined standard of acceptable performance. Progress is based on actual performance rather than on how well learners perform in comparison to others (Lytle & Wolfe, 1989).

Competency-based education and assessment were developed in response to the need to assess adult literacy achievement within a functional framework. Because it

recognizes the importance of prior learning and rewards what individuals can already do, it is more compatible for use with adults than standardized testing. Assessment is also frequent, providing learners with regular feedback and allowing them to advance when ready (Lytle and Wolfe, 1989). Beyond the classroom CBL is a common approach in assessing performance in the workforce. Hence, adult students are familiar with the process. It is also popular at many schools such as DeVry University, where the lessons and methods of assessment are based on the competencies determined and monitored by curriculum managers.

Despite its compatibility with adult education philosophy and practice, competency-based assessment also has its critics. Since it usually takes place within the educational setting, competency-based assessment is still a test given under classroom conditions; thus a key theoretical concept of successful functioning in life roles is removed from the assessment process. Some critics also contend that competency-based assessment systems control and restrict teaching and learning (Lytle and Wolfe, 1989). In the case of DeVry University, instructors are required to cover all the terminal learning objectives prescribed in the curriculum manuals given to them. Instructors can add to the objectives but cannot subtract.

Performance-based assessment

Performance-based assessment (PLA) is a response to the concern of many educators, researchers and society as a whole, that there are a growing number of students, who exit their educational systems without ever having to demonstrate any skill performance capability. According to Ananda, “Performance-based assessment is

grounded in theories of learning that emphasize making meaning through thinking and doing” (Ananda, 2000, p. 6). For example, constructivism holds that knowledge is actively constructed and that individuals create meaning by taking an active role in their own learning (Ananda, 2000).

Performance-based assessment is the assessment method is used for measuring skill applications through demonstrations of competency (Askov, Van Horn & Carman, 1997). However, if a test is criterion-referenced, little help is offered as to who sets the criteria or how criterion-referenced assessment impacts other areas such as letter grade assignment. As a result, assessment in all areas of education is experiencing a shift away from standardized tests towards performance based evaluation using such tools as open-ended questions, student demonstrations and portfolios. The idea of adopting assessment instruments that are closely linked to instruction has been advocated by both teachers and researchers across the country. In 1990, Valencia presented the following four principles as guidelines for quality assessment; authentic, continuous, multidimensional and collaborative (Banta, Lunda, Black, & Oblander, 1996). While norm-referenced achievement tests assess only a small part of the curriculum, performance-based assessment offer a broader view of a learner’s progress that is complex and includes collaborative, authentic, multidimensional evaluative task that measure growth over time (Askov, Van Horn, & Carman, 1997). Because of these desirable characteristics, performance-based assessment is currently being implemented at state, district and school levels.

Performance-based assessment is defined as a task that students must perform rather than simplify selecting an answer from a criterion reference test (Askov, Van Horn

& Carman, 1997). The assessment task is an instance of extended criterion performance, not an estimator of a learning goal. Performance assessments have face validity, as students must perform an observable task that demonstrates comprehension/achievement. In research on performance-based assessment, questions of validity, reliability, generalizability, and accountability have all been raised. Besides these issues, and the lack of teacher training, the issues of time and cost in implementation of performance assessment, and the difficulties of consensus in grading this form of assessment have been broached.

In traditional measurement, the most important identifier of a test is the validations of the results of the test. Face validity states that if something appears to be the behavior that you are attempting to measure. This is not considered scientifically sound by quantitative researchers (McMillan, 1988). Most traditional texts state that one should be sure that the test measures what it is intending to measure. The classroom teacher needs to know and understand reliability to create, use, and interpret performance-based assessment. This is difficult because this type of assessment relies heavily on inter-rater agreement and limited sampling. Heavily used by norm-reference test makers, reliability allows the test scores to spread out. However, is this what we as educators want with instruction? Is the goal of education to rank order students or is it to give the m an equal understanding of a subject or concept?

Cultural change is required to implement PBA. Students trained in the more traditional model of teaching, which features the teacher as "sage on the stage" and disseminator of knowledge, will experience culture shock of a sort. Students will wish to

know expectations for a high grade. Though constructing a rubric with a teacher may allay fears, there is initial suspicion of the new approach.

Students must also learn to be part of the group. As with real life tasks, one person cannot conduct all research and make the entire presentation of the problem solution. Complaints about "hitchhikers" (those in the group who do not pull their own weight) will be heard from hard working students. Teachers also experience major adjustments. More preliminary work must be done to design the problem and to ensure that there are enough materials available (in print, online, and through human resources) for this resource's ravenous approach. They must learn to construct problems that assist students to learn appropriate skills and knowledge. And they must learn to facilitate, rather than direct, student learning.

This approach also requires a though change from a teacher-centered to a problem and project based environment. This often causes discomfort to those that have made the transition speak of new energy and enthusiasm for their classes.

In developing performance-based assessment tasks faculty must do the following:

- Work collaboratively with adult learners;
- Adapt from existing assessment tasks;
- Use curriculum guides and other outlines to guide task development and selection efforts. This will help ensure that all assessment tasks are linked to targeted standards/learning objectives and measure the targeted knowledge and skills (Ananda, 2000).
- As tasks are developed or reviewed, ensure that they meet some sort of agreed upon criteria.

Faculty of adult learners should take into consideration the connection between the expectations of instructors and the behavior of students. If students are taught and assessed using methods that required them to think critically, analyze their work, and revise work samples until they meet rigorous content and performance standards, they will rise to that challenge. “Performance-based assessments, challenging though they may be for adult learners and instructors, are essential to realizing the promise of adult education reform” (Ananda, 2000, p. 29).

Problem-based assessment

Problem-based learning is a pedagogical strategy for posing significant, contextualized, real world situations, and providing resources, guidance, and instruction to learners as they develop content knowledge and problem-solving skills (Mayo, Donnelly, Nash, & Schwartz, 1993). In problem based learning, students collaborate to study the issues of a problem as they strive to create viable solutions. Unlike traditional instruction, which is often conducted in lecture format, teaching in problem based learning normally occurs within small discussion groups of students facilitated by a faculty tutor (Aspy, Aspy, & Quimby, 1993; Bridges & Hallinger, 1991).

Because the amount of direct instruction is reduced in problem based learning, students assume greater responsibility for their own learning (Bridges & Hallinger, 1991). The instructor's role becomes one of subject matter expert, resource guide, and task group consultant. This arrangement promotes group processing of information rather than an imparting of information by faculty (Vernon & Blake, 1993). The instructor's role

is to encourage student participation, provide appropriate information to keep students on track, avoid negative feedback, and assume the role of fellow learner (Aspy, Aspy, & Quimby, 1993).

Table 2: Comparison of traditional methods and assessment and problem-based learning and assessment

The Traditional Method (Positivist)	The PBL Method (Constructivist)
Fact-collecting.	Meaning-making.
Tutor-centered: knowledge is transmitted by a tutor through tutor-driven lectures, seminars or assignments.	Knowledge is acquired by the students through a self-directed search.
Passive process.	Active process.
Individualistic process.	Collaborative process: students work in groups, and are exposed to the viewpoints and knowledge of fellow students.
Learning is based on repetition, rehearsal and memorization, rote learning, regurgitating, and pattern-matching of content-specific tasks.	Learning is based on problem solving skills which combine factual knowledge with the use of methods to achieve goals: Goal setting: Where am I going to learn it? Strategy selection: How am I going to learn it? Goal evaluation: Did it work?
Teaching is subject-based: it works from a body of knowledge to applications.	Teaching is problem-based: it works from a problem to define the (interdisciplinary) frameworks required.
Teaching is disciplinary and disjointed.	Teaching is multi- and interdisciplinary: it integrates and connects across disciplinary boundaries.
Students learn how to pass exams, and are given specific direction (of sources, topics etc.) on how to search for the correct answer.	Students learn to identify what information is needed to solve (or make sense of) the problem, how to frame questions about this information, formulate problems, explore alternatives, where and how to search resources, how to organize the information into a meaningful conceptual framework, and how to

	communicate the information.
The learning that takes place is mostly context-specific and short-lived. It is not adequate to prepare the students for encountering new applications or formulations.	The methods learned during problem-based learning are not context-specific. They allow students to transfer knowledge to approach new and different problems. They establish life-long habits of self-directed learning.
'Problems' in traditional teaching method: When problems are used to illustrate a topic they are usually well-defined, with parameters that lead to predetermined outcomes with one preferred answer.	PBL Problems: A good PBL problem is open to many applications. Thus it enhances a skill of transferring the learning to novel situations.
When problems are used as a vehicle for learning (as in the case-study method) they are used as concrete illustrations of abstract concepts. They are introduced after relevant knowledge has been acquired.	Problems are encountered before any relevant knowledge has been acquired.
The tutor poses the questions, the tasks and the means of finding the solutions (reading lists, hand-outs etc.).	Students are empowered to take charge of the learning process: identify knowledge needed to resolve the problem, generate questions (learning issues) that target the kind of knowledge they want to acquire, and proceed to search for it using a variety of resources.
Evaluation emphasizes the quality of product, based on some elaboration of the material given or directed by the tutor.	Evaluations emphasize the process of the learning and the quality of the integration of knowledge reflected in the "solution".
Traditional assessment is dominated by an exam or an essay type assignment.	PBL is assessed by "a portfolio" that contains one's diary of contribution to the PBL process, self-evaluation, and evaluation of fellow team-members along several criteria. These may include attendance, degree of preparation for class, listening and communication skills, ability to bring new and relevant information to the group, ability to ask questions that further group understanding, etc. Exam questions resemble the PBL process. Students are given a problem to analyze by resolving self-identified learning goals.
Setting the agenda.	Only setting the problems: students set the agenda through defining learning goals.
Tutor responsible for learning.	Students take responsibility for their own learning.
Tutor provides solutions and "right answers".	Tutor does not tell "the right answer" or "what to do": students are expected to provide the answers. They are given space to experiment, make mistakes, and go to original sources to get information.
Tutor is directive: giving lectures (or mini-lectures), asking questions, giving answers.	Tutor is a non-directive facilitator: a coach, a learning manager, a guide, a supportive activator of students' learning initiatives, providing guidance.

Tutor is an authority (expert).	As a facilitator, the tutor's (infrequent) input is to keep the process on track and proceed towards task objectives (tutor may probe students' reasoning processes, or question their logic and beliefs).
Tutor specifies bibliographic references.	Students are encouraged to explore a variety of resources in seeking the information they require. These resources may include library reference sources (paper and electronic), and the internet.

Problem Based Learning, Dept. of Sociology, UCD, Belfield, Dublin.
<http://www.ucd.ie/sociolog/PBL/>

A major weakness of historical and contemporary PBL efforts is the lack of formal student evaluation (Reis & Renzulli, 1991). Assessment of student progress is often haphazard or non-existent. When assessment is formally planned, it often does not align well with the objectives of the problem-based learning that preceded it. The following are some suggestions on how to improve this.

Suggestion One: Treat learners as professionals in the field in which the ill-structured problem exists, and assess them as if you were their supervisor. This is one method use by many trade schools or programs such as the Chubb Institute, Gibbs College and the Computer Information Systems program at DeVry University. One of the greatest challenges to facilitators is to keep learners motivated and engaged in classroom activities. Having students operate as professionals in the field in which the ill-structured problem arises increases student enthusiasm and ownership for learning. For instance, if studying a unit on Green home (environmentally designed home) design, the students could play the role of architects. As part of the role-playing, teachers acting as facilitators and real-world supervisors hold positions that make assessment both appropriate and

realistic. Also in this context, the activity is no longer unrelated to anything outside of the classroom. Students in this scenario can now see that their efforts relate to issues that society has faced or is facing.

Suggestion Two: If instruction is problem-based, assessment should be similarly structured. If students are asked in the course of a unit to solve ill-structured problems through hands-on activities, the assessment should include how well they complete that task. That is not to say an evaluation of their ability to learn factual and foundational information important to solving the problem should not be completed. Rather, an interdisciplinary, real-world and hands-on approach to learning should be evaluated largely in the same manner it is taught. In a critical thinking course I taught at DeVry, my students were required to create a plan on how to improve record management at a company of their choice. Assessment was based on group dynamics, how well they met the tasks given in the project rubrics, and professionalism in both the written plan and presentation. The instructor should instead act as a building inspector and qualitatively and quantitatively evaluate the students' work.

Suggestion Three Do not hold off on assessment until the end of the activity or unit; model real-world behavior, in which ongoing assessment occurs. In traditional classroom teaching, assessment of student learning is often relegated to the end of a given unit. This assessment tends to stress student recollection of factual knowledge, in direct opposition to current beliefs that significant amounts of learning take place during the process of solving a problem. The emphasis on the use of factual knowledge in conjunction with real world problem solving skills makes PBL an advantageous approach to teaching and assessment. As shown in the following three examples, instructors need

to assess students continuously during the course of their problem solving, much as real-world supervisors would oversee a project. For instance, the instructor as building inspector is free to examine how well the students address the established goals while also having the freedom to suggest modifications or sign off on student developments. This role allows the teacher to act as a facilitator, asking guiding questions that allow students to approach a solution or solutions to the problem at hand.

Assessment in a collaborative learning environment

My experience as a teacher and as a student is demonstrative of how the collaborative learning environment enhances critical thinking in adult learners. In the next section I will share examples from my personal experience (at Boricua College and DeVry University) to illustrate how the collaborative learning environments not only foster critical thinking skills but motivated me and other adult learners in carrying out their educational goals and how to assess learning.

Collaborative learning, learning community curricular structures, and assessment of student learning are reform efforts that are each beginning to have important effects on college classrooms and curricula. Springing from different roots, these initiatives have expanded in the past decade to include multiple approaches used in diverse educational settings. Each of these reforms asks faculty members and students to consider teaching, learning and curriculum issues in new frameworks.

Just as collaborative learning and learning communities have emerged in undergraduate education, so has another reform effort: assessment. In the early 1980s, public concerns about the rising costs of education and the quality and effectiveness of undergraduate teaching led to a drive for accountability on our campuses. Assessment, often associated with standardizing testing approaches, was initially touted as a tool for accountability, and the early assessment agenda consisted largely of reporting summative information about students' academic skills and rates of graduation. Imposed from without, and often vague in its real intentions, the initial effect of assessment was to put much of the higher education community on the defensive. Within a few years, though, faculty members and administrators had begun to shape the assessment agenda more to their own purposes. They have begun to view assessment less in terms of an external accountability exercise and more as a long-term internal improvement effort: an opportunity to improve learning and teaching by clarifying outcomes for student learning, asking questions, gathering information to answer questions, and then taking action.

As assessment has continued to evolve on campuses throughout the nation, it has become two coexistent and related agendas: those of both proving and improving: proving in the sense of documenting and describing the results of programs or curricula to institutional or external audiences, and improving in the sense of gathering data for more internal purposes of identifying needs or gaps, solving problems, or developing and strengthening programs. Ideally, assessment efforts act like camera lenses, to focus and clarify our understanding of both what we are doing as teachers and what students are doing as learners. As the classroom assessment approach of Angelo and Cross has revealed, assessment need not be ambitious or large-scale research endeavors conducted

by professional educational researchers. As facilitators, we can carry out assessment in small ways, day-to-day, in each of our classrooms, as we take the pulse of student learning and shape our teaching accordingly.

Collaborative learning contexts are de facto assessment gold mines. In classrooms where faculty members lecture and engage only a few students in discussion, the learning process is mostly a private affair for students. Teachers see evidence of student understanding primarily on occasional quizzes, tests, and papers. Collaborative learning settings differ dramatically because from the beginning of the course, learning is public. Students are engaged in making sense of material and generating meaning-out loud-in full view of teachers and peers. Collaborative learning activities provide a continuous stream of evidence about student learning for all to see. Students working with others can gauge the sense they and their peers are making of the course material, and how they are relating it to previous learning and life experiences. Teachers see immediately what students do and don't yet understand, and where the learning seems to surge forward and where it stalls. Every class, then, naturally offers a wealth of assessment data, which invite mid-course corrections to improve student learning.

On the other hand, the public and collaborative nature of the learning makes the assessment of students more complex. Because student learning is so public in these settings, and because informal rehearsal and performance are such continuous and intertwined processes, student evaluation presents challenges. Do we evaluate students' informal day-to-day work, and if so, how? Do we assess concept mastery? Oral communication? Qualities of teamwork and leadership? If the day-to-day learning is highly collaborative and community building, will individual exams or other forms of

student assessment seem as competitive as to undo the cooperative spirit of the class?

What about the academically strong student who refuses to help others? Or the academically weak student who is a terrific team player? These are just a few of the questions that confront us.

With a plethora of new things going on in collaborative learning settings, the very act of defining appropriate demonstrations of student learning forces us to focus continuous/ongoing means of assessment. Frequently, our intended outcomes for students go beyond their mastery of course material. Rather, we hope these learning experiences will sharpen critical thinking, increase empathy for diverging viewpoints, result in perspective-taking, foster a sense of citizenship, and develop varied communication skills. For teachers to assess students, many traditional testing approaches are inadequate for measuring the complexity and depth of learning that occurs in most of these settings. For students to assess these courses or programs, the traditional end-of-course evaluation form is also inadequate for evaluating the quality, and the impact, of collaborative learning environments. We need to create new tools for this work. What dimension of our teaching, or the students' learning, or the whole course or learning community program are we assessing? As assessors we need to clarify what outcomes are most crucial for us and for our students to assess, and to follow through with assessment activities in those areas.

The pressure to prove innovations also challenges us. While collaborative learning approaches and learning community curricula are spreading, they still represent departures from more conventional approaches. As innovators, we are expected to prove ourselves. Our colleagues want us to demonstrate that students have learned as well (or as

much) as in conventional classrooms. Other colleagues need convincing that what we are doing constitutes legitimate teaching. This is no trivial task: a member of our group working on this handbook tells how his dean arrived to observe one of his classes in which small groups were working through carefully designed discussion problems. Seeing the groups in the room, the dean turned to leave, saying, "Oh, you're doing groups. I'll come back another time when you're teaching."

To educate uninformed or skeptical colleagues, we need to harvest and make more public the richness of the student learning and engagement that we are observing in our classrooms. We need to go public as well with the difficulties of teaching in collaborative learning settings, for it is only through sharing and working through these problems that our efforts will become stronger and more sophisticated.

Collaborative classrooms are natural places in which to learn self-assessment and because decisions about materials and group performance are shared, students feel freer to express doubts, feelings of success, remaining questions, and uncertainties than when they are evaluated only by a teacher. Furthermore, the sense of cooperation (as opposed to competition) that is fostered in collaborative work makes assessment less threatening than in a more traditional assessment situation. Ideally, students learn to evaluate their own learning from their experiences with group evaluation. To ensure that individual student performance is assessed and that the groups know how their members are doing. Groups need to know who needs more assistance in completing the assignment, and members need to know they cannot let others do all the work while they sit back. Ways to ensure that students are held accountable include giving spot quizzes to be completed

individually and calling on individual students to present their group's progress. (Johnson, Johnson, and Smith, 1991).

Give students an opportunity to evaluate the effectiveness of their group. Once or twice during the group work task, ask group members to discuss two questions: What action has each member taken that was helpful for the group? What action could each member take to make the group even better? At the end of the project, ask students to complete a brief evaluation form on the effectiveness of the group and its members. The form could include items about the group's overall accomplishments, the student's own role, and suggestions for changes in future group work. Rau and Heyl (1990) have developed a form that can be used for an interim or final evaluation (Johnson, Johnson, and Smith, 1991).

Second, decide how to grade members of the group. Some faculty members assign all students in the group the same grade on the group task. Grading students individually, they argue, inevitably leads to competition within the group and thus subverts the benefits of group work. Other faculty members grade the contribution of each student on the basis of individual test scores or the group's evaluation of each member's work. If you assign the same grade to the entire group, the grade should not account for more than a small part of a student's grade in the class (perhaps a few bonus points that would raise a test score from a B - to a B). (Johnson, Johnson, and Smith, 1991).

Assessment of critical thinking

Many colleges are looking for better ways to assess student learning in response to student learning either in response to state mandates for accountability or to satisfy quality enhancement objectives. When adults participate in learning activities, they bring many years of experiences with them. They view new material through the lens of these experiences (Baird, Schneier, & Laird, 1983). As adults continue to acquire new knowledge and skills, they must integrate new learning with prior learning. When contradictions or dilemmas result, perceptions based on prior learning must be reexamined. Individuals can choose to reject the contradictory new information or revise their previous views. Transformative learning occurs when positive adjustments to prior learning are made (Cranton, 1996). Critical thinking skills figure prominently among the goals for education, whether one asks developers of curricula, educational researchers, parents, or employers.

Although there are diverse definitions of critical thinking, nearly all emphasize the ability and tendency to gather, evaluate, and use information effectively (Beyer, 1985). A classroom setting designed to for critical thinking requires three specific strategies: 1) building categories, 2) finding problems, and 3) enhancing the environment.

Brookfield, in Developing Critical Thinking, targets the adult learner and asserts that there are two central activities involved in critical thinking. The first consists of helping people analyze and challenge the assumptions under which they, and others, are thinking and acting. The other is exploring and imagining alternatives to their current ways of thinking and acting. (Brookfield, 1987, p. 69). Brookfield also describes the ideal critical thinking environment for adults as one where six conditions are present:

- Diversity and divergence would be encouraged;
 - Flexibility of format and direction would be welcomed;
 - Risk taking and spontaneity would be valued;
 - Facilitators would model openness and critical analysis;
 - There would be no presumption of perfection on the part of the facilitator;
- and
- There would be skepticism of final answers. (1990, p. 71).

CATs (Classroom Assessment Techniques): Angelo stresses the use of ongoing classroom assessment as a way to monitor and facilitate students' critical thinking. An example of a CAT is to ask students to write a "Minute Paper" responding to questions such as "What was the most important thing you learned in today's class? Other CATs recommended by Angelo and Cross as listed in table 3 are:

Table 3: Sample of classroom assessment techniques

Name:	Description:	What to do with the data:	Time required:
Minute paper	During the last few minutes of the class period, ask students to answer on a half-sheet of paper: "What is the most important point you learned today?"; and, "What point remains least clear to you?". The purpose is to elicit data about students' comprehension of a particular class session.	Review responses and note any useful comments. During the next class periods emphasize the issues illuminated by your students' comments.	Prep: Low In class: Low Analysis: Low
Chain Notes	Students pass around an	Go through the student	Prep: Low

	<p>envelope on which the teacher has written one question about the class. When the envelope reaches a student he/she spends a moment to respond to the question and then places the response in the envelope.</p>	<p>responses and determine the best criteria for categorizing the data with the goal of detecting response patterns. Discussing the patterns of responses with students can lead to better teaching and learning.</p>	<p>In class: Low Analysis: Low</p>
Memory matrix	<p>Students fill in cells of a two-dimensional diagram for which instructor has provided labels. For example, in a music course, labels might consist of periods (Baroque, Classical) by countries (Germany, France, Britain); students enter composers in cells to demonstrate their ability to remember and classify key concepts.</p>	<p>Tally the numbers of correct and incorrect responses in each cell. Analyze differences both between and among the cells. Look for patterns among the incorrect responses and decide what might be the cause(s).</p>	<p>Prep: Med In class: Med Analysis: Med</p>
Directed paraphrasing	<p>Ask students to write a layman's "translation" of something they have just learned -- geared to a specified individual or audience -- to assess their ability to comprehend and transfer concepts.</p>	<p>Categorize student responses according to characteristics you feel are important. Analyze the responses both within and across categories, noting ways you could address student needs.</p>	<p>Prep: Low In class: Med Analysis: Med</p>
One-sentence summary	<p>Students summarize knowledge of a topic by constructing a single sentence that answers the questions "Who does what to whom, when, where, how, and why?" The purpose is to require students to select only the defining features of an idea.</p>	<p>Evaluate the quality of each summary quickly and holistically. Note whether students have identified the essential concepts of the class topic and their interrelationships. Share your observations with your students.</p>	<p>Prep: Low In class: Med Analysis: Med</p>
Exam Evaluations	<p>Select a type of test that you are likely to give more than once or that has a significant impact on student performance. Create a few questions that evaluate the quality of the test. Add these</p>	<p>Try to distinguish student comments that address the fairness of your grading from those that address the fairness of the test as an assessment instrument. Respond to the general ideas represented by</p>	<p>Prep: Low In class: Low Analysis: Med</p>

	questions to the exam or administer a separate, follow-up evaluation.	student comments.	
Application cards	After teaching about an important theory, principle, or procedure, ask students to write down at least one real-world application for what they have just learned to determine how well they can transfer their learning.	Quickly read once through the applications and categorize them according to their quality. Pick out a broad range of examples and present them to the class.	Prep: Low In class: Low Analysis: Med
Student-generated test questions	Allow students to write test questions and model answers for specified topics, in a format consistent with course exams. This will give students the opportunity to evaluate the course topics, reflect on what they understand, and what are good test items.	Make a rough tally of the questions your students propose and the topics that they cover. Evaluate the questions and use the goods ones as prompts for discussion. You may also want to revise the questions and use them on the upcoming exam.	Prep: Med In class: High Analysis: High (may be homework)

Angelo, T.A. & Cross, P.K. (1993). Classroom Assessment Techniques (2nd ed.). San Francisco: Jossey-Bass. Classroom Assessment Techniques <http://www.ntlf.com/html/lib/bib/assess.htm>

Across subject areas and levels, educational research has identified several discrete skills related to an overall ability for critical thinking. These are:

- Finding analogies and other kinds of relationships between pieces of information
- Determining the relevance and validity of information that could be used for structuring and solving problems
- Finding and evaluating solutions or alternative ways of treating problems. Just as there are similarities among the definitions of critical thinking across subject areas and levels, there are several generally recognized "hallmarks" of teaching for critical thinking (Beyer, 1985). These include: Promoting interaction among

students as they learn - Learning in a group setting often helps each member achieve more.

- Asking open-ended questions that do not assume the "one right answer." Critical thinking is often exemplified best when the problems are inherently ill defined and do not have a "right" answer. Open-ended questions also encourage students to think and respond creatively, without fear of giving the "wrong" answer.
- Allowing sufficient time for students to reflect on the questions asked or problems posed. Critical thinking seldom involves snap judgments; therefore, posing questions and allowing adequate time before soliciting responses helps students understand that they are expected to deliberate and to ponder, and that the immediate response is not always the best response.
- Teaching for transfer. The skills for critical thinking should "travel well." They generally will do so only if teachers provide opportunities for students to see how a newly acquired skill can apply to other situations and to the student's own experience.

Lessons learned:

- No assignment or assessment can get at all aspects of critical thinking.
- Not every concept or skill we teach requires critical thinking, although it probably helps the student learn it better if he/she thinks critically about it (for example, by asking such questions as "Why do we do it this way?")
- Critical thinking requires a foundation of knowledge. Even thinking critically to learn requires some mental models that can be used to think analogically.

- Students want a litmus test of critical thinking. This is difficult because critical thinking is a continuum.
- Development of a model of critical thinking would probably be helpful to students.
- Students will be motivated to think critically if it results in an improvement in their grades.
- It may not make sense to come up with assessments of critical thinking independent of content – students may not be thinking critically because they don't have enough knowledge of the subject to do so.
- Students have to be given ample opportunity to demonstrate critical thinking – you can't just ask for the facts. The instructor must be willing to read through much "thinking out loud" to see evidence of critical thinking.
- They need to be aware of how a lack of critical thinking can adversely affect their decisions/recommendations. In class discussions, you must take the time to point out how they made an incorrect assumption or jumped to a conclusion, etc.
- Students must realize that to ask relevant questions they will probably ask numerous irrelevant ones as well. That's part of the learning process. Also, not asking questions may lead to incorrect assumptions.
- Necessary components of critical thinking for problem solving – look at consequences, question assumptions, synthesize information/frameworks, consider multiple perspectives (problem definition, alternative solutions, consequences on stakeholders)

Activities that may exercise critical thinking skills:

- create assignments that require students to relate new concepts to existing knowledge
- case analyses
- simulations
- role playing
- critical analysis of articles

Thinking critically is a “dynamic and ongoing process, so that the dividing lines between problem identification, diagnosis, exploration, action and reflection are frequently difficult to discern” (Brookfield, 1987, p. 78). Reflective evaluation is personal and transformative. This makes assessment a challenge in light of the concern for accountability. According to Cranton, “when we go about learning how to be educators, we tend to concentrate only on the epistemic domain - our knowledge and our way of obtaining knowledge (Cranton, 1994, p. 215). Assessment is ongoing and in the case of critical thinking, the goals and objectives are agreed upon by both the facilitator and learner. The facilitator serves as a mentor helping the learner structure a learning program. The classroom is a reflective or connected in that the development of thinking is undertaken in small groups that accept that the process will be tentative, evolving, and uncertain (Brookfield, 1987). Critical thinking assessment fits nicely with the whole idea that assessment evolves like learning and that assessment is a reflective process for both the teacher-facilitator and learner.

Conclusion

Assessment and accountability have played prominent roles in many of the education-reform efforts during the past 50 years. As regards adult education, there are three important themes involved in assessment and accountability.

First, there is a need to established criteria or standards to guide assessment. Is 90 percent or 95 percent an A? What is a B paper? What makes an excellent paper? These questions require the professional judgment of faculty. Because each faculty member's judgments are different, students need to know the standards in operation for each class. Going beyond establishing standards in assessment facilitators and learners must develop assignments that purposeful and relevant. Adult learners want to know their progress because that is a sign of growth and development.

The second theme is that there are many ways to assess students' learning. There is no one universal method of assessment that can assess objectives, outcomes, and actual day-to-day activities. There are many methods with different ideas and processes. The critical thing to understand is that the method selected must take into account the classroom assessment process. Whatever method used must be able to assess what was actually learned. An ill-prepared method will offer results, which are do not help in understanding results nor provide information that can help continuous improvement of the education process. Assessment assists in refining expectations of the level and quality of performance. This only happens when faculty identify criteria, interpret results, and use feedback.

Assessment is appealing to policymakers for several reasons: it is relatively inexpensive compared to making program changes, it can be externally mandated, it can be implemented rapidly, and it offers visible results.

Assessment systems that are useful monitors lose much of their dependability and credibility for that purpose when high stakes are attached to them. The unintended negative effects of the high-stakes accountability uses often outweigh the intended positive effects. It is worth arguing for more modest claims about uses that can validly be made of our best assessments and warning against the over-reliance on them that is so prevalent and popular. To enhance the validity, credibility, and positive impact of assessment and accountability systems while minimizing their negative effects, policymakers should:

1. Provide safeguards against selective exclusion of students from assessments.
2. Make the case that high-stakes accountability requires new high-quality assessments each year that are equated to those of previous years.
3. Do not put all of the weight on a single test. Instead, seek multiple indicators. The choice of construct matters and the use of multiple indicators increase the validity of inferences based upon observed gains in achievement.
4. Place more emphasis on comparisons of performance from year to year than from school to school. This allows for differences in starting points while maintaining an expectation of improvement for all.
5. Consider both value added and status in the system. Value added provides schools that start out far from the mark a reasonable chance to show improvement while status guards against institutionalizing low expectations for those same students and schools.
6. Recognize, evaluate, and report the degree of uncertainty in the reported results.

7. Put in place a system for evaluating both the intended positive effects and the more likely unintended negative effects of the system.

Finally, assessment takes hard work. It requires that teachers and adult learners look at assessment differently. Accountability is critical and active involvement in learning and assessment process, including active engagement in self-assessment places the learner accountable and appreciative of the process. Learning is . . . a dynamic process in which learners actively construct knowledge . . . the acquisition and organization of information into a series of increasingly complex understandings . . . influenced by context (Holt, 1992). Educators who view learning in this way realize that quantitative methods of evaluating learners do not measure up.

References

- Angelo, T. A. (1991). "Ten easy pieces: Assessing higher learning in four dimensions."
In T. A. Angelo (ed.) Classroom Research: Early Lessons from Success. San Francisco: Jossey-Bass. New Directions for Teaching and Learning, no. 46: 17-31.
- Angelo, T.A. & Cross, P.K. (1993). Classroom Assessment Techniques (2nd ed.). San Francisco: Jossey-Bass.
- Askov, E. N., Van Horn, B.L., & Carman, P.S. (1997) Assessment in basic education programs. New directions for adult and continuing education. 75: 65-74.
- Aspy, D.N., Aspy, C. B., & Quimby, P.M. (1993). What doctors can teach teachers about problem-based learning. Educational Leadership, 50(7): 22-24.
- Baird, L., Schneier, C., & Laird, D. (1983). The training and development sourcebook. Amherst, MA: Human Resource Development Press.
- Banta, T. W., Lund, J.P., Black, K.E., & Oblander, F.W. (1996). Assessment in practice: Putting principles to work on college campuses. San Francisco: Jossey-Bass.
- Barton, P. E. (2002). Staying on course in education reform. Princeton, NJ: Statistics & Research Division, Policy Information Center, Educational Testing Service.
- Beyer, B.K. (1985). Critical thinking: What is it? "Social Education," 49, 270-276.
- Bridges, E. M., & Hallinger, P. (1991). Problem-based learning in medical and managerial education. Paper presented for the Cognition and School

Leadership Conference of the National Center for Educational Leadership and the Ontario Institute for Studies in Education, Nashville, TN.

Brindley, G. (1989). *Assessing achievement in the learner-center curriculum*. Sydney, Australia: Macquarie University, National Centre for English Language Teaching and Research.

Brookfield, S.D. (1987) Developing Critical Thinking: Challenging adults to explore alternative ways of thinking and acting. Jossey-Bass, San Francisco.

Borthwick, A. (1995). Body of Evidence. Vocational Education Journal 70(3): 24-26, 48.

Cranton, P. (1996) Professional development as transformative learning. San Francisco: Jossey-Bass.

Cranton, P. (1994). Understanding and promoting transformative learning. San Francisco: Jossey-Bass.

Cranton, P. (1989). Planning instruction for adult learners. Middleton, OH: Wall and Emerson, 1989.

Davis, B.G. (1993). Tools for Teaching. San Francisco: Jossey-Bass.

Hayes, E. R.; Kretschmann, K. J.; and Berry, M. A. (1994). *Portfolio Assessment in Adult Basic Skills Education*. Madison: Madison Area Technical College. (ED 375 254).

Holt, D. D. *Alternative Approaches to Assessment and Evaluation in Family English Literacy Programs*. Sacramento: California Department of Education, 1992. (ED 351 365).

Johnson, D. W., Johnson, R. T., and Smith, K. (1991). *Cooperative learning: Increasing college faculty instructional productivity* (ASHE-ERIC Higher Education Report

- No. 4). Washington, DC: The George Washington University, School of Education and Human Development.
- Jones, J. E. (1994). Portfolio Assessment as a Strategy for Self-Direction in Learning. New Directions for Adult and Continuing Education. 64: 23-25.
- Kasworm, C.E., & Marienau, C.A. (1997). Principles for assessment of adult learning. New directions for adult and continuing education. 75: 5-16.
- Knowles, M. S., Holton, E. F. I., & Swanson, R. A. (1998). The adult learner: The definitive classic in adult education and human resources development. (5th ed.). Houston, TX: Gulf.
- Kopp, K. "Evaluate the Performance of Adults." Module N-6 of Category N. (ERIC Document Reproduction Service No. ED 289 969).
- Lytle, S. L., and Wolfe, M. (1989) Adult Literacy Education: Program Evaluation and Learner Assessment. Information Series no. 338. Columbus: ERIC Clearinghouse on Adult, Career, and Vocational Education, Center on Education and Training for Employment, The Ohio State University. (ERIC Document Reproduction Service No. ED 315 665).
- Mayo, P., Donnelly, M. B., Nash, P. P., & Schwartz, R. W. (1993). Student perceptions of tutor effectiveness in problem based surgery clerkship. *Teaching and Learning in Medicine*. 5(4), 227-233.
- McCarthy, B. (2000) About learning. Wauconda, Ill.: About learning, Inc.

- Merriam, S. B., & Caffarella, R. S. (1999). Learning in adulthood: A comprehensive guide. San Francisco: Jossey-Bass.
- Merriam, S.B., & Brockett, R.G. (1997). The profession and practice of adult education: An introduction. San Francisco: Jossey-bass.
- Mezirow, J. (1991). Transformative Dimensions of Adult Learning. Jossey-Bass, San Francisco.
- McMillian, J. H. (Ed.) (1988). Assessing student's learning. San Francisco: Jossey-Bass.
- Reis, S. M., & Renzulli, J. S. (1991). The assessment of creative products in programs for gifted and talented students. Gifted Child Quarterly. 35:128-134.
- Rose, A. D., & Leahy, M.A. (Eds.) (1997). Assessing adult learning in diverse settings: Current issues and approaches. New Directions for Adult and Continuing Education. San Francisco: Jossey-Bass.
- Rau, W., and Heyl, B. S. "Humanizing the College Classrooms: Collaborative Learning and Social Organization Among Students." *Teaching Sociology*, 1990, 18(2), 141-155.
- Schilling, K. M., & Schilling, K. L. (1998). Proclaiming and sustaining excellence: Assessment as a faculty role. ERIC Digest. Retrieved on October 1, 2004 from <http://www.ericdigests.org/1999-1/excellence.html>.
- Vella, J. (1994) Learning to listen, Learning to teach: The power of dialogue in educating adults. San Francisco: Jossey-Bass.

Vernon, D. T., & Blake, R.L. (1993). Does problem-based learning work? A meta-analysis of evaluative research. Academic medicine. 68(7): 550-563.